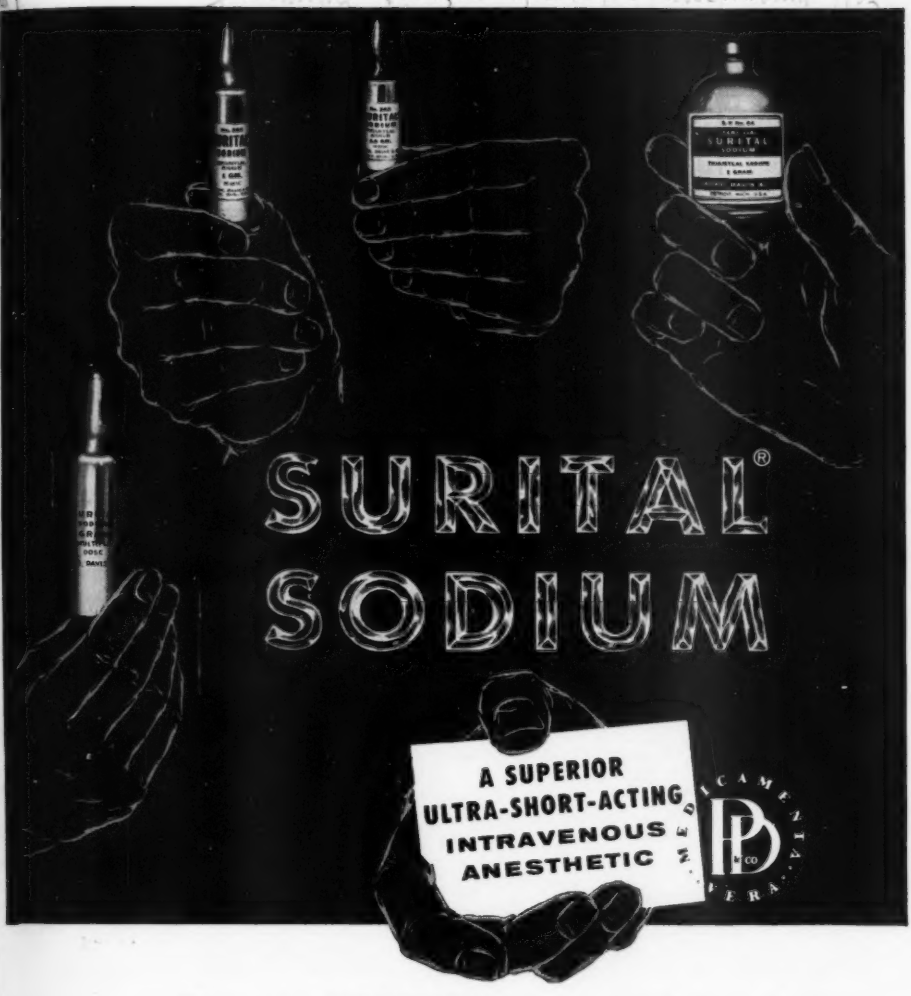
41.8
M69

Veterinary Medicine, v.51, no.11, Nov.1956 cover missing. 1952



The use of SURITAL in animals has shown that induction is smooth and rapid and is free of excitement or irritability or undesirable side reactions.

SURITAL SODIUM (THIAMYLAL SODIUM, PARKE-DAVIS) IS SUPPLIED:

0.2 Gm., 0.3 Gm., 0.5 Gm., 1.0 Gm., 5.0 Gm., and 10.0 Gm. ampoules (Nos. 261, 262, 263, 264, 265, 266); 0.5 Gm. and 1.0 Gm. ampoules with ampoules of Water for Injection, U.S.P.; 1.0 Gm., Steri-Vials (No. 64) (rubber-diaphragm-capped vials); 1.0 Gm. Steri-Vials with ampoules of Water for Injection, U.S.P.

PROFESSIONAL LITERATURE AVAILABLE ON REQUEST

Department of Veterinary Medicine

PARKE, DAVIS & COMPANY

DETROIT 32, MICHIGAN

Denver Dentistry

The Bigness Of Little Differences

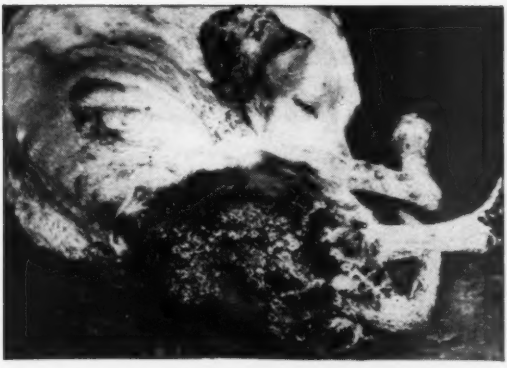
In few fields does the little difference loom so large as in the production of hog cholera vaccine. At Fort Dodge, no test, no precaution is spared to assure the effectiveness of M·L·V. Not only must U.S.D.A. requirements be met, but each serial must pass a series of extra tests to prove optimum purity, potency and safety.

In guarding livestock, the tiniest extra margin of protection is tremendous. Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

M·L·V *The Original*

TRADEMARK

FORT DODGE ... *EVERLASTINGLY IN SEARCH OF THE SURER, THE SAFER*



Even when the prognosis looks hopeless

CORTONE®

ACETATE

(VETERINARY, SALINE SUSPENSION) (CORTISONE ACETATE, MERCK)

Case History: A dog with second and third degree burns covering 25 per cent of the body surface was treated with 'CORTONE' parenterally administered and other medication. After 12 days of therapy the burn was healed except for a small area. The patient's appetite and general condition were much improved.

Supplied: Saline Suspension 'CORTONE' Acetate, Veterinary—50 mg. per cc.; 10-cc vials. Veterinary Department.

MSD

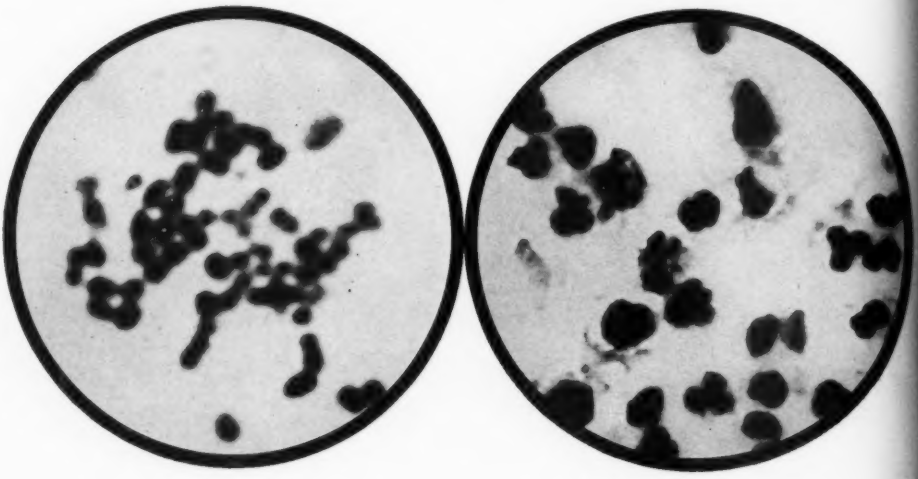
MERCK SHARP & DOHME

DIVISION OF MERCK & CO., INC. PHILADELPHIA 1, PA.

U. S. VETERINARY LICENSE NO. 3.

CORBIOT*

is indicated in



specific and non-specific mastitis

The infection and concurrent inflammation of specific (infectious) mastitis are attacked by the wide antibacterial activity of the TRIPLE ANTIBIOTICS and the effective anti-inflammatory action of the HYDROCORTISONE combined, for the first time, in CORBIOT.

The inflammation of non-specific (non-infectious) mastitis is effectively treated only by a remedy designed to overcome inflammation. CORBIOT, first with HYDROCORTISONE, is first with TOTAL THERAPY of mastitis – against the infection *and* the inflammation.

FIGHT INFECTION • FIGHT INFLAMMATION • FORESTALL SCARRING • SAVE PRODUCTION

Teatube*-CORBIOT*

Available in tubes of 10 Gm.

*TRADEMARK, REG. U. S. PAT. OFF.

a product of Upjohn Research

VETERINARY MEDICAL DEPARTMENT, THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

Election Year Stakes

Vital issues face the veterinary profession today, the consequent conclusion of which depends in some considerable measure on appropriate legislative action.

Most urgent of these are:--

(1) Mandatory federal veterinary inspection of poultry for wholesomeness.

(2) Improved controls for additions of chemicals in foodstuffs.

(3) Usefulness of the Veterinary Corps in the Armed Services.

Each of these and a number of others almost certainly will command the attention of legislators who will be sent to Washington next month.

Failure to pass effective legislation relating to poultry inspection at the last session of Congress has been criticized considering evidence presented of its need. Attention of consumers to shocking cases of diseased poultry gaining entrance to market channels is resulting in popular demands for laws governing interstate movement of noninspected poultry products.

Public health officials, including veterinarians specially trained and functioning in official public health capacities, have expressed grave concern regarding the number of chemicals now being added to foodstuffs on which too little information is available regarding their actions and side actions, in the quantities demonstrated to be present.

Public concern has mounted as increased publicity is given to examples of chemical additives passed as safe by the Food and Drug Administration, although subsequently proved to have hazardous potential.

The Wilson Memorandum is not a "dead" issue. Professional interest as well as publicity have assured that the matter of the Veterinary Corps' position in the Army and Air Force will be up for congressional consideration.

Opinions are profound in proportion to the information at hand. Legislators are ordinarily influenced by recommendations of investigating committees if their constituents fail to inform them on specific issues. Veterinarians are influential members in their respective communities. The opinions they express to their Representatives and Senators will demand consideration.

Positions of candidates should be requested on the issues of vital importance to the veterinary profession. If prospective legislators require further information on which to base decisions, all available materials on the subject should be provided by the profession as well as by the individual.

VETERINARY Medicine

Established 1905

Registered in U. S. Patent Office

A Monthly Magazine Devoted to the Promotion of the Art and Science of Veterinary Medicine

Vol. LI NOVEMBER 1956 No. 11

Published Monthly by the

VETERINARY MEDICINE PUBLISHING CO.

Suite 803, Livestock Exchange Building
Kansas City 2, Missouri, U.S.A.
Telephone: Victor 2-2985

—EDITOR—

ROBERT L. ANDERES, B.S., D.V.M.

—DEPARTMENT EDITORS—

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

MORRIS ERDHEIM, D.V.M.
Chicago, Illinois

A. O. FOSTER, B.A., M.A., Sc.D.
Beltsville, Maryland

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

JAMES H. STEELE, D.V.M., M.P.H.
Atlanta, Georgia

—REPRESENTATIVE—

H. J. Mostyn, 125 Cordova Blvd.
St. Petersburg 4, Fla.

SUBSCRIPTION RATES. One year, $5.00; two years, $8.75; three years, $12.00. Single copy, 50c. U. S. Funds. Postage prepaid. Authorized agents will present letter of collection authority. Pay no money to others.

Entered as second class matter at the post office at Kansas City, Missouri. Entered as second class matter under the title of the American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under the Act of March 3, 1879.

All matter appearing in this publication is copyrighted. No part of it may be reproduced without written permission. Permission will be given if the purpose is unobjectionable. If there be any question as to the propriety of reproduction the author will be consulted.

CHANGE OF ADDRESS: Prompt notice of change of address is requested to assure accurate mailing, giving old and new address. Address all communications to Veterinary Medicine, Suite 803, Livestock Exchange Bldg., Kansas City 2, Missouri.

Copyright, 1956, by the Veterinary Medicine Publishing Co., Kansas City 2, Missouri

In This Issue . . .

General Practice . . .

The Prophylaxis and Treatment of Gut Edema Using 5% Sulfamethazine, 5% Sulfamerazine Solution—Johannes Austvoll 507
Cholinesterase Activity of Normal Blood of Cattle and Sheep—R. D. Radeleff and George T. Woodard 512
Further Studies on the Anthelmintic Action of Piperazine Citrate—R. F. Shumard and D. F. Eveleth 515
Electricity A Potential Hazard to Farm Animals—Charles T. Bush 518
Effect of Passive Immunity, Mode of Inoculation, and Dose of Virus on Immunity Response in Bronchitis—F. R. Beaudette, J. A. Bivins, Helen E. Burd, and C. B. Hudson 519
Anthrax in Livestock During 1955—C. D. Stein 530

Small Animal Practice . . .

Chronic Solar Dermatitis of the Dog.—Francis T. Candlin 523
Approaching Canine Dentistry—T. H. Brasmer 527
Treatment of Certain Eye and Ear Disease of the Dog: A Clinical Report—R. M. Stone 530
Flood, Hurricane and other Casualty Losses are Tax Deductible—Harold J. Ashe 535

Editorial Comment . . .

Alamagordo Victims 511
High Energy Rations Need Additional Methionine 511
Virus Reservoirs 511
Bovine Pulmonary Adenomatosis 514
Shocking Loss due to Mastitis 517
California Issues Poultry Inspection Regulation 517
Arizona Serotypes 522
Radiography for Veterinary Practitioner 530
Veterinarians and Fur Breeders Design Disaster Service Program 536
The Denver System 537
Fats and Health 537
New Facts Relating to Rabies 538
Advertising Policy of Dog World 538
Business and Economic Principles can be Applied to Veterinary Practice 541
Aroused Awareness of Highway Hazards 543
The Muffly Retriever 543
Doctor Marshak Accepts Professorship to Pennsylvania School 543
Historical Scurvy 543
"On the Medical Team to Guard Your Health" 544
Social Security Benefits for Veterinarians 546
Dipping Pigs for Lice XXXII
Omohundro to Head USDA Poultry Disease Eradication Program XXXIII
Hormone Pellets Stimulate Gains in Feed Lot Cattle XXXIV
Improper Use of Mastitis Preparations XXXVI
New All-Metal Clinical Thermometer XXXIX
Leptospirosis: A Major Disease of Livestock XLV
Poultry Practice Problems—W. R. Hinshaw 545
Principles of Animal Health—R. R. Dykstra 547
Public Health—James H. Steele 548
Veterinary Nutrition—Morris Erdheim 550
Meeting Calendar L
Necrology LII

in weeping skin conditions...

VARITON CREAM breaks the itch-scratch-itch cycle

1) overactive secretion of acetylcholine at nerve endings triggers itching and swelling

2) intensified scratching stimulates further secretion of acetylcholine—with increased edema, vasodilation and pruritus

3) VARITON Cream blocks this chain reaction

- dries oozing lesions
- halts itching and scratching
- curbs inflammation
- helps prevent secondary infections

Now in 2 sizes

50 Gm. tube: for office use and dispensing

20 Gm. tube: a good dispensing item

Schering

time is a factor in bovine ketosis

METICORTEN*

prednisone

1. **more rapid recovery**
   - puts animals back on their feet usually in 24 hours
   - restores milk production to normal levels or above within 3 to 7 days

2. **single-dose economy**
   - "markedly reduces the usual duration of ketosis as well as the number of repeat visits"[1]

3. **clinically proved effectiveness**
   - of 300 cases of both primary and secondary ketosis "over 81% (243) recovered with only one injection"[2]

effective, too:

in arthritis and inflammatory conditions in horses, cattle and dogs

as supplemental therapy in shock and stress conditions

in nonspecific dermatoses in small animals

flexible dosages:

METICORTEN Aqueous Suspension, 10 mg. cc., 10 cc. vial, boxes of 1, 6 and 72.

METICORTEN Aqueous Suspension, 40 mg. cc., 5 cc. vial, boxes of 1, 6 and 72.

METICORTEN Tablets, 2.5 and 5 mg., bottles of 30 and 100.

1. Morris, R. G., and Hall, C. E.: A preliminary report on the use of Meticorten in Bovine Ketosis, J.A.V.M.A. 128:152 (Feb. 1) 1956.

2. Siegrist, J. C.: Newer advances in corticoid therapy, Vet. Med. 51:319 (July) 1956.

*T.M.

Schering

Have you considered the advantages of ***Aeroderm***® *plastic spray-on bandage in the following?*

After bovine laparotomy...

Sprayed directly over sutures, Aeroderm forms a tough, flexible, transparent, plastic film barrier which protects against infection, abrasion and injury from body discharges. Cleanly healing incision fosters uneventful recovery.

In severe excoriation...

The tough Aeroderm film protects the excoriated area from further damage and fosters healing, e.g., urine burns of thighs in obese bitches, excoriation by serum discharge from oophorectomy wound, deep excoriation by searing discharge from infected bite wound. When excoriation is anticipated, Aeroderm dressing protects against injury.

In equine herniorrhaphy...

While tissues repair naturally, Aeroderm protects the incision from contamination by dirt and sweat and from injury by abrasion. The tough Aeroderm film is impermeable to bacteria and encourages clean wound healing.

After docking the dog's tail...

Aeroderm spray-on bandage conforms to the "difficult" shape of the stump. The protective film keeps the wound clean and avoids injury or infection from the dog's licking.

For surgical wounds in the perineal region...

Tissues can repair normally when protected against fecal contamination and urine burns by Aeroderm. This spray-on dressing adapts to body sites previously almost impossible to dress and withstands movement.

Aeroderm is sterile as supplied in 6 oz. aerosol-type dispenser. Two or three light coats are sprayed directly onto the aseptic wound, allowing a few seconds for drying between coats. Cost of Aeroderm dressing, as applied in three coats, is about ½ cent per square inch covered or approximately seven cents to dress a four-inch wound. Why not try it on your next suitable case? Aeroderm is available through your veterinary supply dealer.

For reprints of veterinary journal reports, please write:

AEROPLAST CORPORATION

420 Dellrose Avenue, Dayton 3, Ohio

® REGISTERED TRADEMARK

good traveling companion for faster, safer antibiotic therapy-

STECLIN

HYDROCHLORIDE

SQUIBB TETRACYCLINE HYDROCHLORIDE

- *broad spectrum anti-microbial activity*
- *fewer undesirable side effects*
- *3 easy-to-use forms*

HERE'S A SAFE AND EFFICIENT "LIFE SAVER"—One that makes the most of every minute you use "on call." It's Steclin Squibb. Keep an adequate supply in your bag, in its three easy-to-administer forms. Then, when broad spectrum antibiotic therapy is indicated, you know you're prepared to treat a wide range of diseases at a moment's notice, including those caused by gram-positive and gram-negative bacteria, spirochetes, certain rickettsias, and certain large viruses.

STECLIN IS UNUSUALLY WELL TOLERATED by both large and small animals, resulting in a remarkably low incidence of the gastro-intestinal side effects which often complicate recovery after therapy with other antibiotics. Steclin is promptly absorbed into the bloodstream, effectively penetrates body tissues and fluids including the cerebrospinal, peritoneal and pleural, and reaches high levels in the urine.

SUPPLY

New Steclin Soluble Powder is available in ½ lb. bottles, each containing 12½ grams tetracycline hydrochloride. *Also:*

CAPSULES: 50 mg., 100 mg., and veterinary sizes of 250 mg.

INTRAMUSCULAR: Veterinary sizes of 100 mg., 1 gram, 2.5 grams

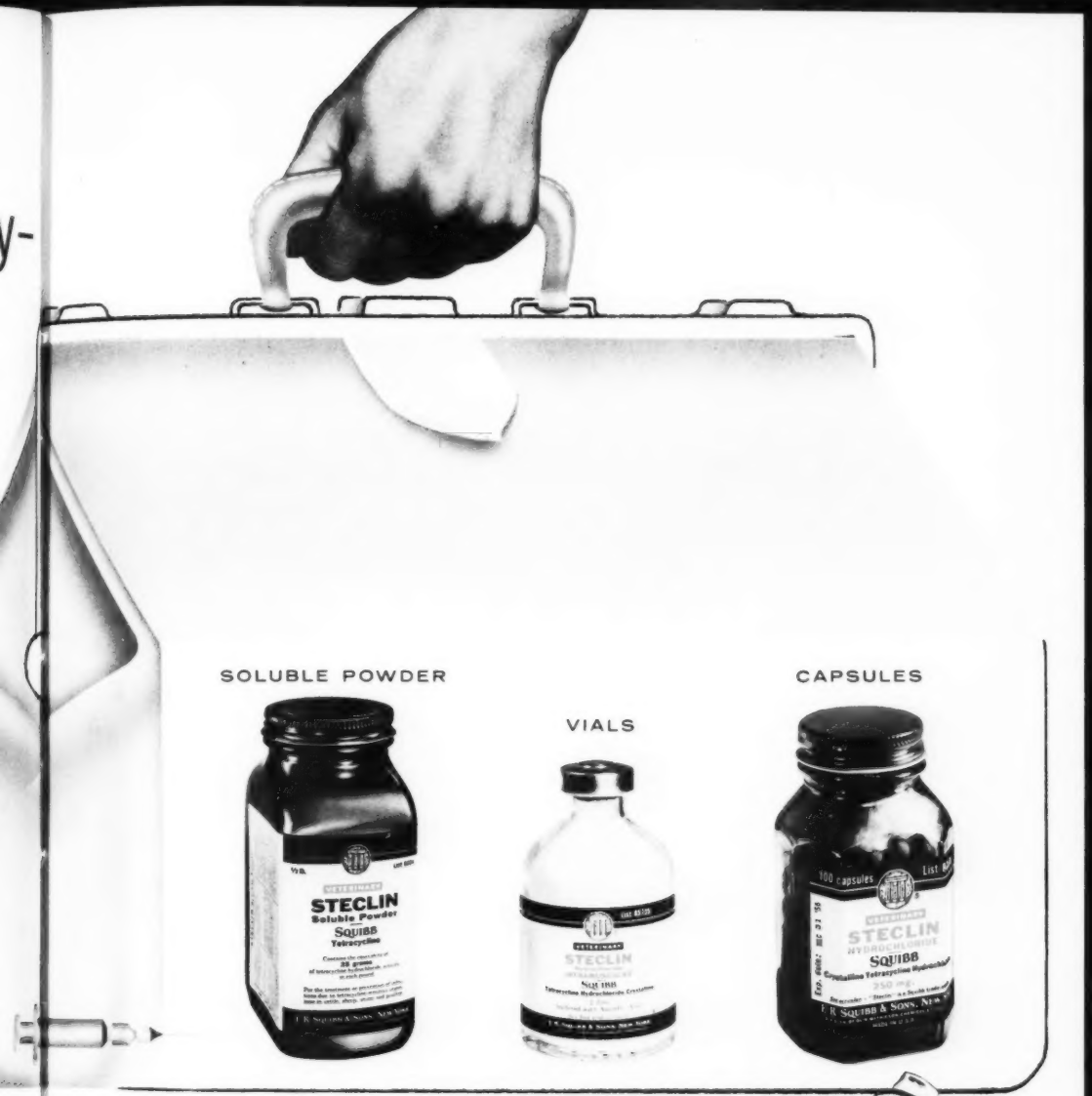
INTRAVENOUS: 250 mg., 500 mg.

DOSAGE:

ORAL: *Small animals,* 10-50 mg. per lb. of body weight per day in divided doses; *large animals,* 5-10 mg. per lb. of body weight per day.

IV OR IM: *Small animals,* 2-5 mg. per lb. daily; *large animals,* initially 2 grams followed by 1 gram daily for 3 or 4 days or until recovery.

STECLIN IS SOLD ONLY TO VETERINARIANS



INDICATIONS:

Steclin is indicated in the treatment of the following conditions when due to tetracycline-susceptible organisms:

Bacterial infections associated with canine distemper; bronchitis; calf scours; enteritis; equine influenza; erysipelas; feline enteritis; hemorrhagic septicemia; infectious coryza; influenza; lamb dysentery; leptospirosis in dogs; metritis; nephritis; otitis media; parotitis; peritonitis; pharyngitis; pneumonia; pyelonephritis; septic mastitis; staphylococcal and streptococcal infections in the foal; tonsilitis; ulcerations; upper respiratory complications; urinary tract infections.

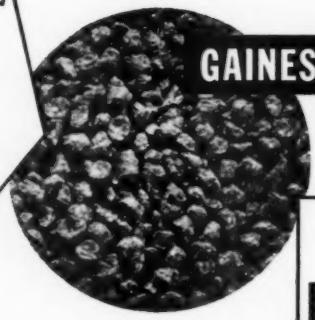
STECLIN IS AVAILABLE upon prescription from your pharmacy, through your wholesaler, or from your favorite veterinary supply house. For further information about Steclin, or other Squibb veterinary products, write: SQUIBB, *Veterinary Products Department*, 745 Fifth Avenue, New York 22, N. Y.

SQUIBB QUALITY

—THE PRICELESS INGREDIENT

Steclin® is a Squibb trademark.

the big difference here...



makes a big difference here...

Yes, Gaines makes the difference

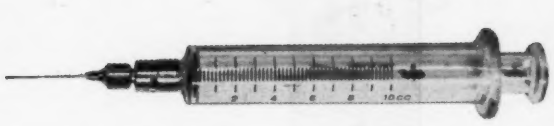
because the special Gaines homogenizing process combines ingredients of the Gaines formula into appetizing granules—each granule containing uniform amounts of every food element dogs are known to need.

Gaines program of quality control, testing and research is an exacting and never-ending one. It results in what we honestly believe is the highest standard possible in the production of dog food. Gaines Homogenized Meal is far more assimilable, more palatable and much easier to feed . . . good reasons why Gaines is America's largest-selling dog meal.

Gaines indeed makes the difference . . . you can use Gaines with confidence . . . recommend Gaines with confidence . . . because complete and uniform nourishment is guaranteed.

A Product of General Foods

Gaines ***HOMOGENIZED*** **DOG MEAL**



immunize against distemper and hepatitis with one single shot...

Sin-jex is the first vaccine to utilize a vacuum-dried modified live virus distemper fraction, with killed virus hepatitis fraction as diluent! This modified live virus distemper fraction elicits a more marked response; hence, Sin-jex assures more positive immunity.

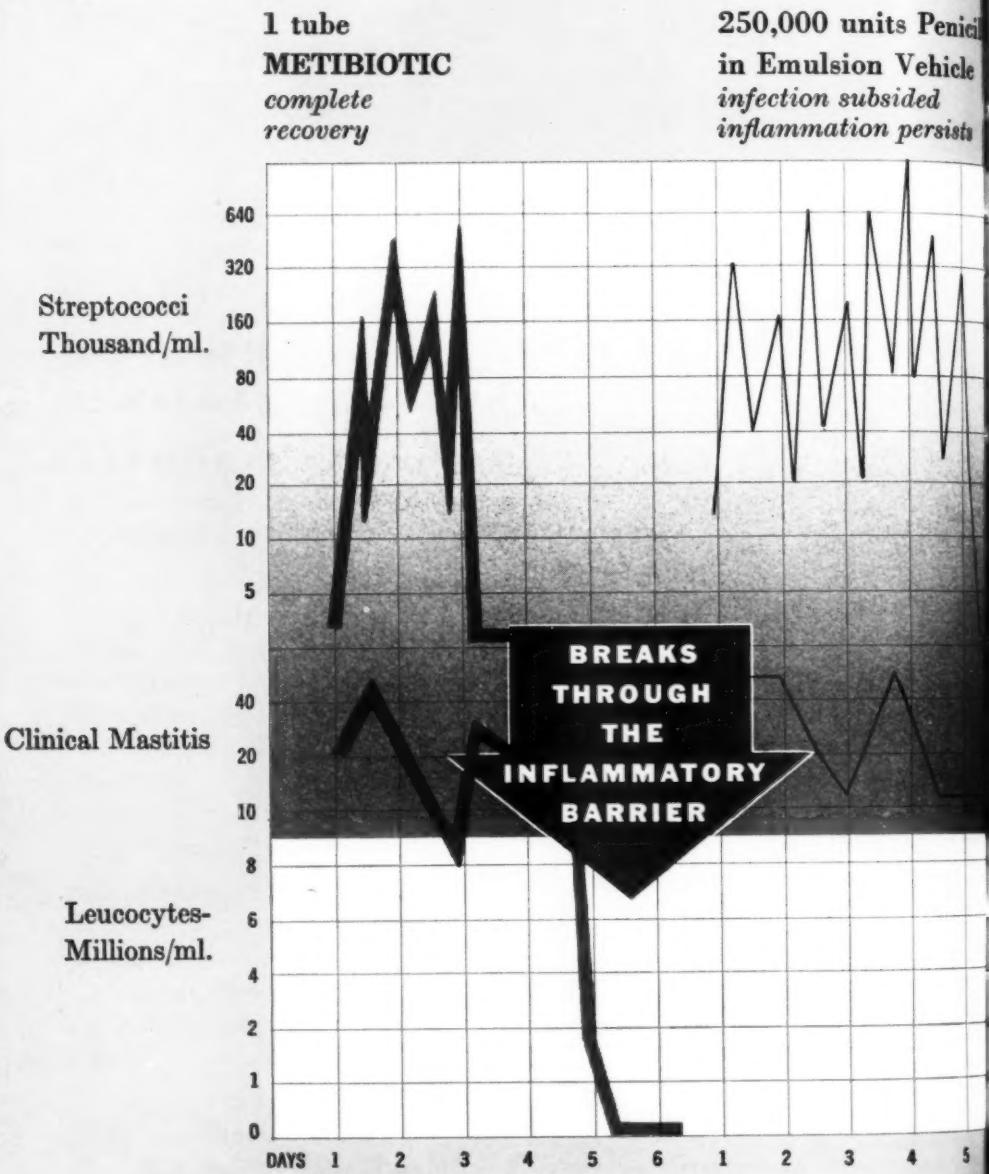
R_L's "reconstitiquick" feature means Sin-jex reconstitutes instantly in a fine, homogenous suspension which passes readily through a 22 gauge needle. Sin-jex requires a simple subcutaneous injection which may be given before or after weaning—simultaneously with or without Anti-Canine Distemper Serum and Anti-Infectious Hepatitis Serum (Bival Sera R_L).

Available from independent ethical distributors.

Research Laboratories, Inc.
St. Joseph, Missouri

distemper hepatitis
sin-jex
vaccine

COMPARISON OF METIBIOTIC *Veterinary* AND PENICILLIN IN TREATMENT OF BOVINE MASTITIS[1]



ANNOUNCING...

The most modern, complete therapy of Bovine Mastitis...

METICORTEN* *Acetate*

plus

PENICILLIN

plus

STREPTOMYCIN

equals

METIBIOTIC*

Veterinary

for intramammary infusion

- **PROMPTLY** reduces inflammation
- **QUICKLY** eradicates infection
- **RAPIDLY** restores full lactation
- **MARKEDLY** decreases udder damage
- **STRIKINGLY** shortens convalescent time

Schering

Packaging: METIBIOTIC Mastitis Infusion Veterinary, 7.5 cc. tube, boxes of 12, 72 and 144.

METIBIOTIC,* brand of procaine penicillin-dihydrostreptomycin in oil with prednisone acetate.

SCHERING CORPORATION • BLOOMFIELD, N. J.

1. Schering Corporation: Clinical Research Laboratories. Unpublished data. MB-J-176

*T.M.

GROWN entirely IN GLASS

Viracine is the only tissue cultured hog cholera vaccine. It provides live modified virus completely controlled and checked for virulence, safety and potency! Animal passage plays no part in its modification and has no part in its production. In the face of known exposure to hog cholera, pigs vaccinated as long as three years before with VIRACINE and anti-hog cholera serum have proved to be SOLIDLY IMMUNE.

The proved way to build

SOLID IMMUNITY

Of the three types of live, attenuated hog cholera vaccines on the market today, only one (Viracine—Tissued Cultured) is not available to the layman under one label or another. Viracine is your vaccine exclusively. It comes in 5, 25, and 50 dose packages, complete with diluent. Use Viracine and you'll see the difference—in the clean, white dried vaccine, in the nearly clear, restored vaccine and in the immunity produced in the pig. Only Viracine offers you all these "grown in glass" advantages!

CUTTER Laboratories
Berkeley, Calif. • Chicago Ill.
LEADER FOR YEARS IN HOG CHOLERA VACCINES.

FOR PROBLEM HERDS **B.T.V.®/CUTTER**
• Safe, too, for pregnant sows • Can't spread hog cholera • Does not throw pigs off feed • No virus setback • Economical to use.

"Millions of hogs have gone to market protected by B.T.V."

Pfizer TETRACYCLINE-VET

soluble powder

Provides the ultimate in solubility, dissolving completely in *seconds*. Test it yourself. You'll be pleased with the convenient administration and optimal results. Here is dependable *broad-spectrum* antibacterial activity for administration in feed and drinking water; also effective in solutions for irrigation of wounds and cavities.

Available in bottles of ½ lb., containing 25 Gm. of tetracycline activity per lb. An average teaspoonful contains 200 mg. tetracycline activity.

NEW! Tetracycline-Vet Soluble Powder is now available in 5 lb. canisters—a convenient and profitable package.

Sold only to veterinarians

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

PARLAMATE

piperazine citrate, PARLAM

eliminates WORMS in one treatment

'PARLAMATE' IS IDEAL for LARGE and SMALL ANIMAL USE

Safe New All-Species, Anthelmintic up to 85-100% Effective Against Roundworms and Nodular Worms

DOSAGE FORMS

'PARLAMATE' Powder (contains 100% piperazine citrate). In preweighed dispensing packages convenient for office and field use.

Bottles of 1 oz., 4 ozs., 1 lb.

'PARLAMATE' Tablets, 250 mg. (each tablet contains the equivalent of 100 mg. available piperazine).

Bottles of 100 and 1,000 tablets.

'PARLAMATE' Liquid. (Each teaspoonful, approximately 5 cc., supplies 250 mg. piperazine citrate, which is equivalent to 100 mg. available piperazine.)

Bottles of 1 pint and 1 gallon.

- Safe, fast and most effective.
- Non-toxic and easily tolerated.
- No hair or feather-staining, hepatic damage, gastro-intestinal irritation, or other serious side effects.
- No pretreatment starving or purging necessary.
- Very palatable.
- Easily administered in feed or drinking water, or by dose syringe, drench or stomach tube.
- Only 1 treatment needed.
- 85-100% effective against mature and immature large roundworms (Ascaris) and nodular worms (Oesophagostomum).
- Long acting durable effect; parasites passed for several days.
- Economical to use.

'PARLAMATE' IS NOW AVAILABLE FOR IMMEDIATE DELIVERY

At Your Supplier, or Write

Parlam CORPORATION • 340 Canal Street, New York 13, N. Y.

"Devoted to progressive veterinary research for the development of superior products for graduate veterinarians."

Sole Canadian Distributor: Veterinary Medical Supply Co. of Canada, 6579 Somerled Ave., Montreal, Que.

Announcing...

multipurpose

sulfonamide solution

INDICATIONS: Bacterial pneumonias, shipping fever, endometritis, kidney infections, and foot rot in cattle. Also in the scours-pneumonia complex of calves, in bacterial infections of swine, and in secondary infections accompanying distemper in dogs.

ADMINISTRATION: Large and small animals— 50 cc. for each 100 lb. bodyweight (approximately 1 gr/lb), orally or as one dose. Repeat at 24-hour intervals for 1 to 4 days, using one-half the original dose. Provide adequate amounts of fresh drinking water. For herd treatment of swine— 1 to 2 oz. added to each gallon of drinking water daily for 4 to 5 days.

FORT DODGE

FORT DODGE LABORATORIES, INC., FORT DODGE, IOWA

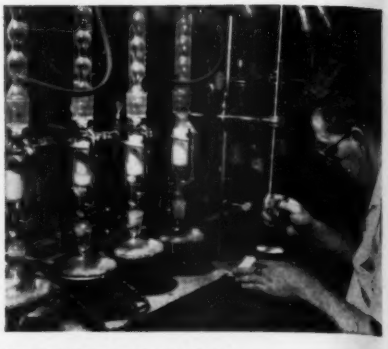
WARNER-CHILCOTT

New products developed exclusively for the veterinarian will soon be announced

Warner-Chilcott Laboratories is pleased to announce organization of its new DIVISION OF VETERINARY MEDICINE, with research, administrative, and production facilities located at Morris Plains, New Jersey.

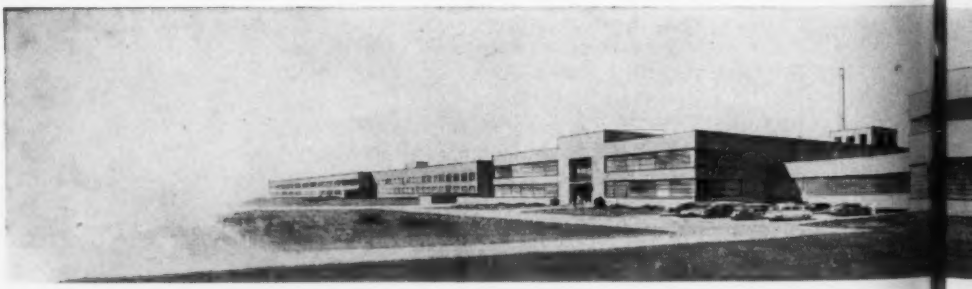
1956 marks Warner-Chilcott's 100th year of service to the medical profession, producing ethical drugs and pioneering in pharmaceutical research.

Now, Warner-Chilcott serves the veterinary profession with products developed exclusively for and sold only to veterinarians through ethical veterinary distributors.



PRODUCT RESEARCH

Research is the backbone of Warner-Chilcott's growth and fine reputation in the medical field. Modern research facilities and outstanding personnel are now employed in the development of many valuable new products for the veterinary profession.

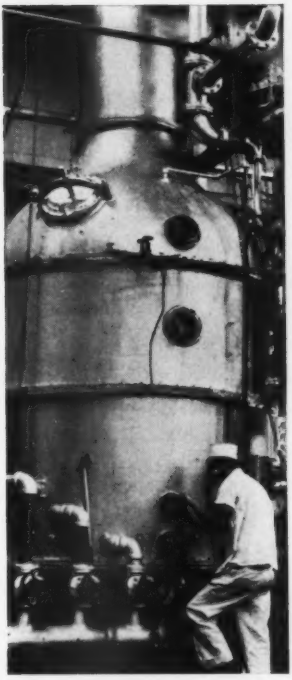


Division of Veterinary Medicine

ow serves the veterinary profession

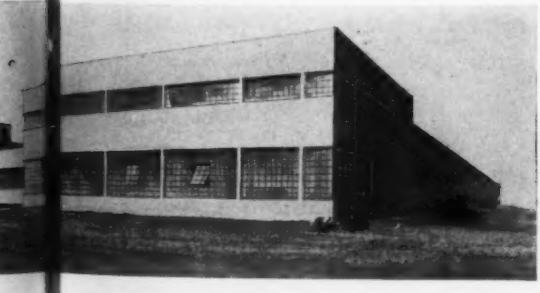
CLINICAL RESEARCH

Two new products, developed exclusively for the veterinarian, will soon be made available. These and other promising new medications are now under extensive clinical investigation by veterinarians and at universities and agricultural experiment stations throughout the country.



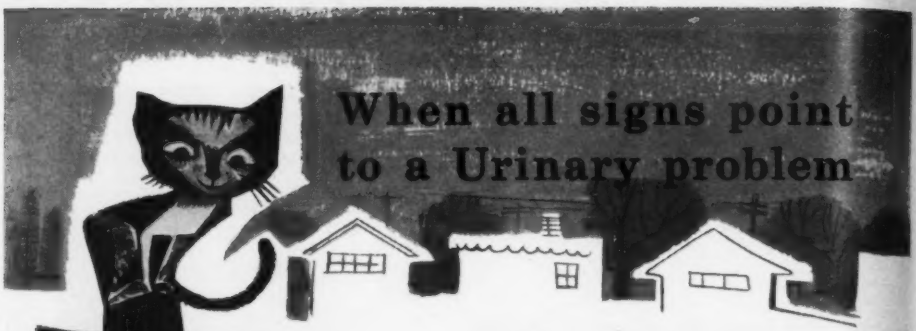
PRODUCTION

One hundred years of experience producing fine pharmaceuticals assure the veterinary practitioner of products, dosage forms, and packages designed specifically for his use. Every product for veterinary and human use undergoes extensive laboratory and clinical control. The highest standards of purity and effectiveness are maintained.



Warner-Chilcott veterinary products are developed for and sold only to veterinarians through ethical veterinary distributors.

WARNER-CHILCOTT *Laboratories*, MORRIS PLAINS, N. J.



the treatment of choice is

urised

veterinary

URISED...

Methenamine, salol, methylene blue and benzoic acid combat urinary tract invaders—reduce bacterial and pus-cell content, promote healing.

URISED...

Atropine, hyoscyamine and gelsemium relax smooth muscle along the urinary tract—relieve painful spasm quickly.

URISED...

Unexcelled for long-term therapy—no contraindications, no reports of toxic effects.

URISED...

Formation of alkaline calculi discouraged in acid urine.

To treat all urinary problems of small animals, specify **URISED,** *veterinary*

VETERINARY DIVISION

CHICAGO PHARMACAL COMPANY

5547 N. Ravenswood Ave.,
Chicago, Illinois

Pacific Coast Branch
381 Eleventh St.
San Francisco, Calif.

SOLD TO GRADUATE
VETERINARIANS ONLY

Send for literature and clinical trial supply of **URISED,** *veterinary*

Every Time a Good Dairy Cow Goes to the Butcher . . .

. . . there's a good chance she went there because somebody left a milking machine on too long.

Surge Dealers are working hard to stop this bad habit. If you know anyone who is in trouble, tell us. We'll get help on the job in a hurry.

Surge

Babson Bros. Co. will be glad to supply you a quantity of this helpful folder for distribution to your clients. Write to —

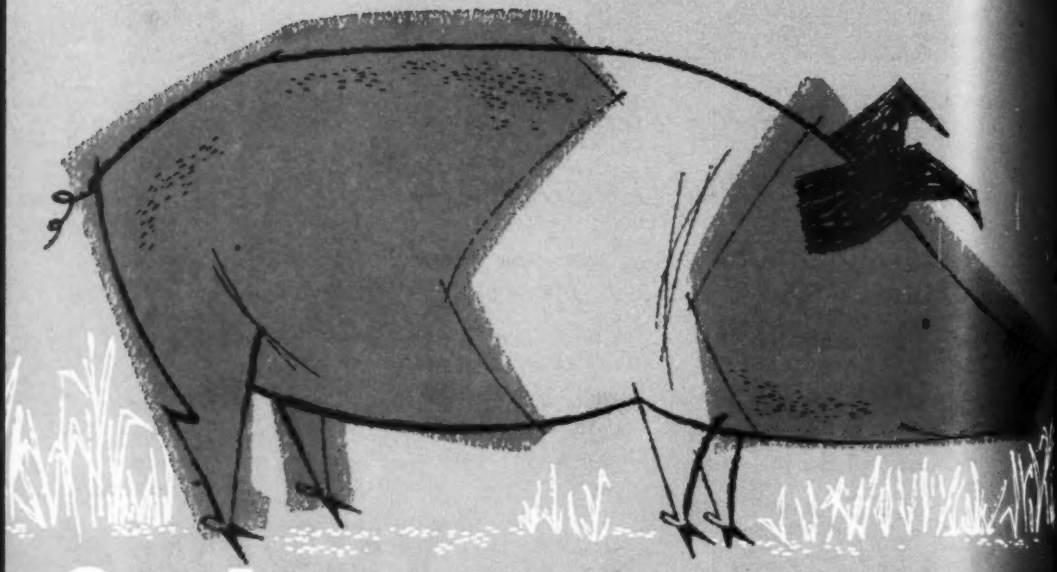
BABSON BROS. CO.

2843 W. 19th Street • Chicago, Illinois

ATLANTA • HOUSTON • KANSAS CITY • MINNEAPOLIS • SACRAMENTO • SEATTLE • SYRACUSE • TORONTO

SAFETY FIRST...

with lasting protection



Swivax*

The superior hog-cholera vaccine for **SOLID** immunity

MODIFIED LIVE VIRUS • RABBIT ORIGIN • VACUUM DRIED

*REGISTERED TRADE MARK

(Licensed under U.S. Patent 2518978)

PITMAN-MOORE COMPANY division of **ALLIED LABORATORIES, INC.**

V
M

The Prophylaxis And Treatment Of Gut Edema Using 5% Sulfamethazine, 5% Sulfamerazine Solution

JOHANNES AUSTVOLL, Veterinary Surgeon,
Stavanger, Norway

THE etiology of gut edema (edema disease of swine) has not yet been established. However, several theories as to its cause have been proposed. Timoney[7] is of the opinion that the disease is a specific toxemia, while Schofield[6] indicates that it may be an enterotoxemia. The writer is of the opinion that the symptoms are caused by toxins which are elaborated by bacteria found in the bodies of affected animals. If such is the case, it follows that drugs to which these toxin-producing bacteria are sensitive should be of value in the treatment of edema disease as it appears in the field.

In searching for an effective agent to satisfactorily prevent and control gut edema, we have in recent years used numerous drugs, including parenteral penicillin, streptomycin, sulfamethazine, B vitamins and oral phthalylsulfathiazole. Currently, the most satisfactory results have been obtained by intraperitoneal injection of merameth® 10%, a solution containing 5% sulfamethazine-5% sulfamerazine.

Materials and Methods

To determine the value of intraperitoneal sulfonamide solutions as a prophylactic and therapeutic agent against gut edema in swine, a series of field trials were conducted. A total of 210 pigs ranging in age from 8 to 16 weeks were included in the studies. All sick animals were treated; some exposed but apparently unaffected animals were treated prophylactically, and the rest were left as controls. Sufficient sulfonamide solution was administered so that each sick pig received a total dose of 1 cc. per lb. body weight, while those pigs which were treated prophylactically received 0.5 cc. per lb. Extremely sick pigs were removed and isolated, but those animals showing only a staggering gait and/or edema of the eyelids were allowed to remain with the unaffected animals. No change was made in the feeding program at any time. In most cases a single injection of sulfonamide solution was made. However, in a few instances the treatment was repeated a second time.

Results

Case 1. On May 6, 1955, ten pigs, nine weeks of age, weighing 25 kg. each were presented. All animals except one in the group were healthy and had excellent appetites. The sick animal was lame in all four legs as well as anorectic. Rickets was suspected in this animal and calcium gluconate was administered subcutaneously. On May 7, 1955, a second pig of the group became lame in all four legs. Both affected animals at this time exhibited edema of the eyelids, and one had a hoarse grunt and appeared ill. Both animals received 40 cc. of sulfonamide solution intraperitoneally. Four animals received 22 cc. each intraperitoneally (experimental). Four pigs received no treatment (control). All animals were allowed to remain together in the same sty.

®Sharp & Dohme, Division of Merck & Co., Inc. Philadelphia, Pa.

On May 8, 1955, the two sick pigs which were treated died. One animal in the experimental group showed heavy eyelid edema, and later in the day developed a staggering gait. All pigs appeared to have good appetites. Postmortem examination of the two dead pigs revealed a slight edema in the spiral coil of the colon in each animal. In addition, one animal had an intussusception 20 cm. in length in the small intestine. The edema around the eyelids was pronounced in both. The affected pig of the experimental group continued to show palpebral edema, but its appetite remained excellent.

On May 9, 1955, a second pig of the experimental group was found to have edema of the eyelids and had a staggering walk. One pig of the control group was ill and became lame. This animal had no appetite and died

Fig. 1. Gut edema disease. Paralysis and heavy edema of the eyelids characterize the disease clinically. Opening the mouth on each inspiration was also noted in this animal.

during the following night. On necropsy a slight edema in the spiral coil of the colon was found. Both of the experimental pigs that became sick after prophylactic treatment was administered recovered, and by May 16, 1955 all animals were in good health.

Case 2. On June 3, 1955, 19 pigs, ten weeks of age were presented. One animal had died suddenly the previous day, and a second was seriously ill showing lameness, edema of the eyelids, dyspnea, and anorexia. This animal received 40 cc. of sulfonamide solution intraperitoneally. Nine apparently healthy animals received 20 cc. intraperitoneally (experimental), while eight were held as controls and received no treatment.

On June 4, 1955, the sick animal died. Postmortem revealed edema of the eyelids, edema of the spiral coil of the colon, and an increased amount of reddish-colored fluid interspersed with fibrin threads in the peritoneal cavity.

On June 5, 1955, one pig which had been treated prophylactically became sick and died the next day.

On June 7, 1955, a second pig in the prophylactically injected group became ill and lame. This animal received no further treatment and by June 8, 1955, although listless, had begun to eat. It later recovered.

Case 3. On June 21, 1955, 11 pigs, four months of age were examined. One animal was *in extremis.* This animal received 45 cc. of medication intraperitoneally. Five of the other animals received 22 cc. each intraperitoneally, while five animals were held as controls. All animals remained in the same sty and were fed as usual. By June 22, 1955, the sick animal was dead. Autopsy revealed pronounced edema of the spiral colon and an increased quantity of sanguinous peritoneal fluid. The same day one pig in the untreated control group became ill and died four or five hours later.

On June 23, 1955, a second pig of the control group, one of the largest in the group, also became ill and died in 24 hours with typical symptoms of gut edema. Seven days later the remainder of the pigs appeared in good health.

Case 4. On July 11, 1955, eight pigs, nine weeks of age were observed. Two animals exhibited visible symptoms of edema disease. Both walked with a stagger, and one was lame in the hind legs. Both were given 45 cc. of sulfonamide solution intraperitoneally. Three animals received 20 cc. each, and three animals, no treatment.

On July 13, 1955, the sick pig which had been lame died, and on postmortem showed edema in the eyelids and in the spiral coil of the colon. The other sick animal recovered uneventfully. No further difficulty was encountered in this group.

Case 5. On July 20, 1955, 12 pigs, 14 weeks of age were presented. One had died suddenly and showed extreme edema of the spiral coil of the colon on autopsy. There were three other sick pigs with edema of the eyelids and a staggering gait. The remaining eight had poor appetites, and were considered to be incubating the disease. Each animal in the group received 45 cc. of sulfonamide solution intraperitoneally, and all had recovered by August 1, 1955.

Case 6. On July 20, 1955, ten pigs, eight weeks of age were presented. One animal had

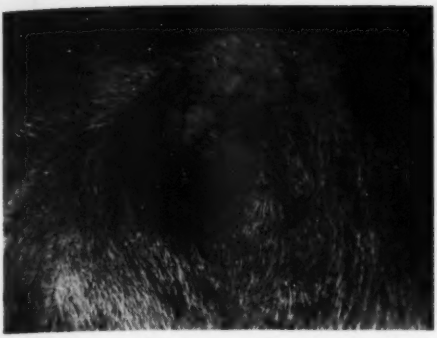


Fig. 2. Illustrating severe edema of the eyelids. Note black spot at inner canthus mentioned by some observers.

extreme edema of the eyelids, a hoarse grunt and could hardly get to its feet. This animal was given 45 cc. of sulfonamide solution intraperitoneally. Four other animals received 20 cc. intraperitoneally, and five animals were left as controls.

On July 21, 1955, the sick animal was much improved and could walk around with comparative ease. At this time, a second 20 cc. of sulfonamide solution was given intraperitoneally. On July 24, 1955, further improvement was noted and the rest of the herd appeared normal.

On July 30, 1955, the sick animal had recovered, and the entire herd was normal.

Case 7. On July 22, 1955, 11 pigs, nine weeks of age, two of which were ill and showing extensive edema of the eyelids were presented. One animal was edematous in the submandibular region, had a severe dyspnea, and was lame in all four legs. Both sick animals received 45 cc. of medication intraperitoneally. Four animals received 20 cc., and five were left as controls.

On July 23, 1955, one sick animal had died and on postmortem revealed edema of the eyelids, the submandibular tissues, and of the spiral coil of the colon. There was also an increased amount of reddish-colored peritoneal fluid. The second sick animal recovered by August 2, 1955; there were no further outbreaks.

Case 8. On July 23, 1955, eight pigs, 12 weeks of age, were presented, all of them with symptoms of gut edema. Two of the animals were ill with severe dyspnea and a staggering gait. All the others had edematous eyelids and extremely hoarse grunts. Each animal received 45 cc. of medication intraperitoneally.

On July 24, 1955, one animal had died and typical edema in the intestine were demonstrated. A second pig died latter the same day exhibiting similar lesions.

By July 27, 1955, the remaining six animals had recovered, and edema had disappeared from the eyelids. All made uneventful recoveries.

Case 9. Two litters of ten animals each, one sick animal in each litter, were presented. In litter no. 1, all animals were given 20 cc. of sulfamerazine-sulfamethazine solution. In the second litter only the sick pig was treated, receiving 40 cc. intraperitoneally. The sick animal from litter no. 1 recovered, and the treated animal from litter no. 2 died. The others remained healthy.

Case 10. A litter of ten pigs was presented, with one pig exhibiting symptoms. The sick animal received two injections of 40 cc. intraperitoneally at an interval of three days. The other nine received one injection of 20 cc. The sick animal recovered slowly, and there were no further outbreaks.

Cases 11 and 12. Two groups of pigs in separate sties were observed. The first sty contained 20 pigs, eight to nine weeks of age, two of which were sick. The second sty contained 24 nine-to ten-week-old pigs. three of which were ill. The animals in the first sty were treated as follows: The two sick animals received 40 cc. of sulfonamide intraperitoneally, while ten received 20 cc. The remaining eight received no treatment. In sty no. 2 two of the sick pigs received 40 cc. intraperitoneally, 12 received 20 cc., and nine were held as controls.

All of the sick pigs in both sties died. At the end of seven days, three animals of the ten in sty no. 1 which had been prophylactically injected, were ill; and one had died. One animal in the untreated control group had died. In sty no. 2 five of the 12 prophylactically injected group were affected, and four died. Five pigs of the untreated control group were sick, and all died.

Case 13. Ten pigs, all showing edema and muscular incoordination, were given sulfonamide solution intraperitoneally, in conjunction with epsom salts in the feed. All of these pigs recovered.

Case 14. Thirty-seven pigs, nine weeks of age were presented, two of which died six days later with typical symptoms and lesions of gut edema.

On May 27, 1955, another two pigs died, both exhibiting typical symptoms and lesions

of gut edema, and two others were sick. The two sick animals received 40 cc. of sulfonamide solution intraperitoneally, 16 received 20 cc., and the other 15 were held as untreated controls.

On June 15, 1955, the two sick animals had recovered, and no other animals were affected.

Discussion

In case no. 1, two animals developed edema of the eyelids and a staggering gait following the prophylactic injection of intraperitoneal sulfonamides. These animals lost their appetites for approximately one day, and subsequently made a rapid recovery. Since the sulfonamide solution was administered previous to the onset of symptoms, it is suggested that the severity of the disease in these animals was reduced so that they were able to survive.

In case no. 3, the two largest and thriftiest animals in the untreated control group became sick and died. The same phenomenon appeared in case no. 12. A common opinion held by farmers in this region is that those swine with excellent appetites and unusually rapid growth rates seem to be most seriously affected and show the highest mortality when gut edema appears in the herd. In the majority of cases observed, only a few animals in each litter exhibited symptoms. Usually only one or two animals in a litter are affected or die, with the remainder showing no symptoms whatsoever.

It may seem unnecessary to treat healthy pigs prophylactically, but examination of the following table will indicate that the mortality figures for pigs in the untreated control groups (which later became ill) was 100%; in the group treated prophylactically, 70% of the animals that became ill following prophylaxis eventually recovered. Those animals that were extremely ill at the time of presentation showed little response to treatment. Animals in which the symptoms were not pronounced at the time of treatment, and that were treated as soon as possible after the onset of symptoms, showed satisfactory rate of recovery; only 14 of 40 pigs in this group succumbed to the disease.

In some cases, the treatment of extremely sick animals seemed to be of some temporary benefit, enabling pigs to survive longer than is usual without treatment; however, no permanent benefits were obtained.

Conclusions

This paper is a preliminary report on the value of a mixture of 5% sulfamerazine and 5% sulfamethazine, sterile solution, administered intraperitoneally in the treatment and prevention of gut edema in swine. From the preliminary data here presented, it seems justifiable to make the following deductions:

1. In many outbreaks there may be only one or a few affected animals in each group presented.

			Sick Animals treated				Experimental pigs (Prophylactic)					Controls				
Herd no.	No. of pigs	Died before treat.	No. treat.	Died	Rec.	Rec. %	No. treat.	Died	Sick & Rec.	Healthy	% of sick Rec.	No. treat.	Healthy	Sick	Died	% of sick died
1	10	0	2	2	0	0	4	0	2	2	100	4	3	1	1	100
2	19	1	1	1	0	0	9	1	1	7	50	8	8	0	0	0
3	11	0	1	1	0	0	5	0	0	5	none sick	5	3	2	2	100
4	8	0	2	1	1	50	3	0	0	3	none sick	3	3	0	0	none sick
5	12	1	3	0	3	100	8	0	8	0	100	0	0	0	0	—
6	10	0	1	0	1	100	4	0	0	4	none sick	5	5	0	0	none sick
7	11	0	2	1	1	50	4	0	0	4	none sick	5	5	0	0	none sick
8	8	0	8	2	6	75	———		none	———		———		none	———	
9	20	0	2	1	1	50	9	0	0	9	none sick	9	9	0	0	none sick
10	10	0	1	0	1	100	9	0	0	9	none sick	———		none	———	
11	44	0	5	5	0	0	22	5	3	14	38	17	11	6	6	100
12																
13	10	0	10	0	10	100	———		none	———		———		none	———	
14	37	4	2	0	2	100	16	0	0	16	none sick	15	15	0	0	none sick
Total	210	6	40	14	26	65	93	6	14	73	70	71	57	9	9	100

2. If animals become affected after prophylactic treatment with sulfonamide solution, 50% of the animals should recover.

3. Mortality in sick, untreated animals is 100%.

4. Sick pigs treated intraperitoneally appeared to improve slightly and die less rapidly than those that receive no treatment.

5. Use of sulfamerazine-sulfamethazine mixtures intraperitoneally in the treatment and prevention of gut edema will save a large number of animals; in the writer's hands it has proved more effective than any other treatment previously used.

Summary

This report describes some field trials using sulfamerazine-sulfamethazine solution in the treatment and prevention of gut edema disease in pigs. The solution is administered intraperitoneally, and is found to be more effective than any agent previously used. Treatment of all pigs in affected litters is recommended. The recommended prophylactic dose is 0.5 cc. per lb. of body weight, and the therapeutic dose 1 cc. per pound of body weight.

REFERENCES

1. Austvoll, J., Grisedauen (Pig Death). *Norsk Vet. Tidsskr.*, 59:202, 1947.
2. Austvoll, J., Grisedauen (Pig Death). *Medlemsblad f. norske Veterinaerforen*, 2:8, 1950.
3. Austvoll, J., Grisedauen, ein ny grisesjukdom. (Oedema Disease of Pigs, a New Disease Among Pigs). *Maanedskr. f. Dyrlaeg.*, 62:224 and 278, 1951.
4. Austvoll, J., Oedema Disease in Swine. *Vet. Rec.*, 64:135, 1952.
5. Austvoll, J., Grisedauen og litt om diarre. ("Pig Death" and Some Comments on Diarrhoea,). *Medlemsblad f. norske Veterinaerforen*, 6:183, 1954.
6. Schofield, F. W., Should the Name "Oedema Disease" be Changed to "Enterotoxaemia of Swine"? *Vet. Rec.*, 65:443, 1953.
7. Timoney, J. F., Experimental Production of Oedema Disease of Swine. *Vet. Rec.*, 61:710, 1949.
8. Timoney, J. F., Oedema Disease of Swine. *Vet. Rec.*, 62:748, 1950.
9. Timoney, J. F., Oedema Disease of Swine. *Irish Vet. Jour.*, 5:82 and 106, 1951.

▼ ▼ ▼

Alamagordo Victims

Seven of the 47 cattle that were exposed to radioactive particles resulting from the first detonation of the atomic bomb at Alamogordo, N. M., still survive. Most of those dusted received no more than superficial skin wounds; none have died as a result of radiation.

Of the 40, some were killed for experimental purposes; others died of old age. Fourth generation descendents of this herd exhibit no obvious generic effects.

High Energy Rations Need Additional Methionine

It has been known for some time that as total protein levels are increased in livestock feed, certain imbalance of amino acid intake results.

Experiments conducted by Dr. H. R. Rosenberg and associates of the Du Pont's Stine Laboratory, Newark, Del. demonstrate that productive energy (calorie) content of the feed governs the amount of methionine needed at various protein levels for best growth and feed efficiency. From a practical standpoint, these finding show that if this amino acid (methionine) is the only one inadequate in a high energy ration, levels can be increased by the addition of the amino acid. That improved performance can be expected by such fortifying has been demonstrated in tests. What is generally believed true of methionine possibly will be shown to be true of other amino acids.

Bringing earlier working into perception resulted in a rule of thumb that when the calorie content of a practical poultry ration containing about 21% protein is increased by 100 calories per pound, methionine content should be increased by about 0.07% of the total ration.

The new work reported at the Poultry Science Association in Raleigh, N. C. indicates that as total protein is increased, a higher proportion of methionine to calories seem to be required. Work is continuing to establish an exact optimum mathematical relationship between components of a ration.

▼ ▼ ▼

Virus Reservoirs

According to a note appearing in the current issue of the *Rocky Mountain Veterinarian*, U. S. Public Health Service researchers collected a large number of hibernating female mosquitoes *(culex farsalis)* from 31 different locations in mines located in Colorado foothills. Western equine encephalomyelitis virus was identified in many of the specimens collected as indicated by virus growth in freshly hatched chicks.

Considerable significance is attached to these findings since they confirm insect virus reservoirs of a serious disease of mammals. In this particular instance horses and man are considered incidental hosts to a disease of birds. The discovery and study of what has been referred to as "overwintering mechanism of this virus" may contribute to furthering understanding of success of infection of various pathogenic agents and effective control.

Cholinesterase Activity Of Normal Blood Of Cattle And Sheep

R. D. RADELEFF,* D.V.M., and GEORGE T. WOODARD,* D.V.M.
Kerrville, Texas

THE widespread use of cholinesterase-inhibiting organic phosphorus insecticides such as parathion, malathion, and dipterex requires the veterinarian to become familiar with the normal cholinesterase values for the blood of animals in order to intelligently diagnose poisoning by such materials. The need is emphasized by the possible future use of chemical warfare agents that are also cholinesterase-inhibitors.

The cholinesterase activity of the blood is taken as an indication of the activity probably present in the nervous system. It is indirect measurement but appears to reflect the true condition.

Much work has been done with the bloods of man, laboratory animals, and other small mammals. Little has been published regarding these values in large animals.

In the course of toxicological studies of organic phosphorus insecticides it became necessary to follow the cholinesterase values of bloods through the period of poisoning and recovery. The control values determined for those animals form the basis of this paper. A guide to the interpretation of abnormal values will be published as a separate report.

Methods

All methods thus far developed for cholinesterase determinations rely upon the *in vitro* reaction of the cholinesterase with esters of choline under fixed conditions, the quantity of acid produced serving as the index of cholinesterase activity. The acid production may be measured colorimetrically, manometrically, or electrometrically.

Because of requirement for a method that would be reasonably rapid and simple, the electrometric method of Michel was selected. The results reported are those obtained by following in general the procedure set forth in his paper[1]. The assistance of Mr. George Winter and Miss F. Hermenze of the American Cyanamid Company during the early part of the work is hereby acknowledged.

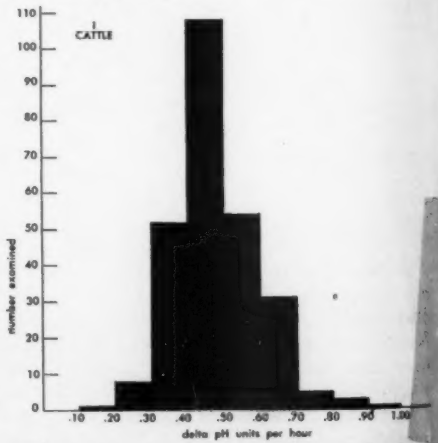
For those who may not have access to Michel's paper, his procedure as modified for use is described. Six solutions are required:

1. Saline. 0.9% sodium chloride.
2. Saponin. 0.01% saponin in distilled water.
3. Buffer for erythrocytes. 4.1236 gm. sodium barbital; 0.5446 gm. potassium dihydrogen phosphate; 44.73 gm. potassium chloride.

For one liter of buffer reagents are dissolved in 900 ml. distilled water, then approximately 28 ml. of 0.1 N hydrochloric acid is added to bring the final pH to 8.10 at 25 C.

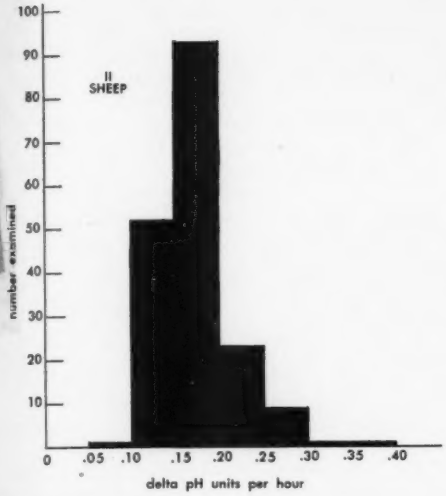
4. Acetylcholine substrate. 2.00 gm. acetylcholine chloride in 100 ml. distilled water.
5. Standardizing buffer for pH meter.
6. Heparin solution — 10 mg./cc.

Equipment needed is as follows: Centrifuge, 10 ml. and 1 ml. pipettes, graduate centrifuge tubes, test tubes, water bath, 5 ml. beakers to fit pH meter, and a pH meter accurate to ± .01 pH unit.



Histogram 1. Range of erythrocyte cholinesterase activity of 283 normal cattle bloods from mixed ages and sexes.

*Animal Disease and Parasite Research Branch Agricultural Research Service, United States Department of Agriculture.



Histogram II. Range of erythrocyte cholinesterase activity of 180 normal sheep bloods from mixed sexes and ages.

Procedure

Approximately 5 cc. of blood are drawn into a graduated centrifuge tube containing 0.1 ml. of heparin solution and mixed. The tube is then centrifuged at 1600 r.p.m. (16 in. dia.) for 15 minutes. The plasma is then separated. Cells are then mixed with 2-3 volumes of saline and again centrifuged for 15 minutes. After discarding the supernatant saline, the procedure is repeated, centrifuging for 20 minutes. The volume of cells is noted and the supernatant removed so that the remaining volume is twice that of the cells alone. The cells are then mixed with the remaining saline, producing a 50% suspension of cells.

After mixing, 0.4 ml. of cell suspension is hemolyzed in 9.6 ml. of saponin solution. One milliliter of hemolyzed red cell solution, representing 0.02 ml. of cells, is added to 1 ml. of buffer solution in a 5-ml. beaker, mixed, and the beaker then placed in a water bath at 25 C. After allowing ten minutes for equilibration, the initial pH (pH_1) is determined with a pH meter to the nearest .01 pH unit. Then 0.2 ml. of the acetylcholine solution is added with rapid mixing and the time recorded.

The reaction is allowed to proceed for one hour, then the final pH (pH_2) is taken. A reagent blank is run at the same time to determine the non-enzymatic change in pH. Cholinesterase activity in delta pH units per hour is then the difference between pH_1 and pH_2, minus the reagent blank.

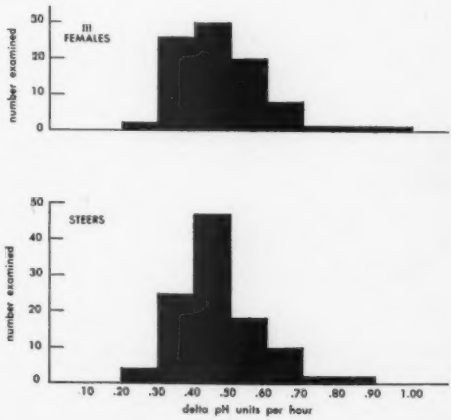
In early work it was found that there was little or no cholinesterase in the plasma of sheep and cattle; hence the method described here and the results obtained are confined to the activity of the enzyme in erythrocytes. The absence of the enzyme in these plasmas has been confirmed by Hermenze and Winter (personal communications) and by Stowe[2].

Animals

The sheep and cattle employed in these studies were those to be used later for treatment with insecticides. All were in range condition, free of disease and maintained under normal conditions.

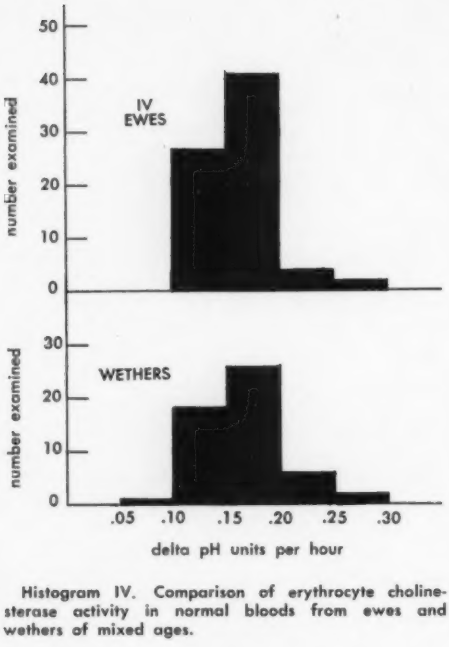
Results

The results of erythrocytic cholinesterase determinations in 253 cattle bloods and 180 sheep bloods are shown in histograms I and II. The mean activity value for cattle was between .46 and .47, the range .17 to .96 delta pH unit/hour. For sheep the mean was between .16 and .17, the range .08 to .40 delta pH unit/hour. These values are much lower than those reported for the human, being approximately 54% and 19% of the human value, respectively, for cattle and sheep.



Histogram III. Comparison of erythrocyte cholinesterase activity in normal bloods from steers and females of mixed ages.

Differences between castrated male and entire female cattle are illustrated in histogram III. The differences were not great insofar as range was concerned nor in general distribution except that a larger proportion of castrated males fell in the .40 to .50 delta pH/hour group than did females.



Histogram IV. Comparison of erythrocyte cholinesterase activity in normal bloods from ewes and wethers of mixed ages.

Differences between wether and ewe sheep are illustrated in histogram IV. The difference in range was caused by a single individual. There was little difference between these groups other than the range.

Conclusions and Summary

Using an electrometric method for the determination of cholinesterase activity, the mean value for 253 samples of bovine erythrocytes was found to be between 0.46 and 0.47 delta pH unit per hour, the range 0.17 to 0.96. For 180 sheep the mean was between 0.16 and 0.17, the range 0.08 to 0.40.

No significant cholinesterase activity was present in the plasmas of sheep or cattle.

REFERENCES

1. Michel, Harry O., An Electrometric Method for the Determination of Red Blood Cell and Plasma Cholinesterase Activity. *Jour. Lab. and Clin. Med.*, 34:1564 (Nov.), 1949.

2. Stowe, C. M., The Curaruform Effect of Succinylcholine in the Equine and Bovine Species—A Preliminary Report. *Cornell Vet.*, 45:193, 1955.

3. Wolfsie, J. H., and Winter, G. W., Statistical Analysis of Normal Human Red Blood Cell and Plasma Cholinesterase Activity Values. *Archives of Indust. Hygiene and Occupational Med.*, 6:43 (July), 1952.

Bovine Pulmonary Adenomatosis

A new disease entity of cattle, termed pulmonary adenomatosis is reported by Monlux, Bennett and Kingrey[1] as occurring in widely separated counties in Iowa. The anomaly appears to be associated with feeding practices since the authors observed that when affected animals were brought to the clinic and fed the clinic rations, recovery began almost immediately. Improvement of condition was progressive and complete recovery was effected within a week or ten days generally. Some animals *in extremis* when presented, died of complicating pneumonia or pulmonary edema.

History and symptoms reveal characteristics differing in several respects from shipping fever from which this disease must be differentiated. Several major points cited by the authors include: Pulmonary adenomatosis appears in good weather of late summer and fall among animals in a good state of nutrition and managed under accepted good husbandry practices. Factors predisposing to pneumonia (inclement weather, sales barn exposure, transportation) are absent. Coughing and nasal discharge, common symptoms of pasteurellosis are not part of the symptom complex, nor is morbidity comparable. Affected animals do not respond to therapeutic agents such as antibiotics, antiserum, sulfonamides, et cetera, which have proved useful in effecting relief of symptoms of shipping fever.

This new disease emphasizes the importance of considered feeding practices and the necessity for their proper evaluation by veterinary practitioners. Just what factor (s) have been introduced to cause a pathological process is a pressing point and suggests the urgent need for reevaluation of those feeding practices employed in feed lots where this disease has occurred. This appears to be a problem for the veterinary nutritionist who is charged with the responsibility of maintenance of health through proper nutrition.

▼ ▼ ▼

Pennsylvania poultrymen, in cooperation with the Agricultural Experiment Station are experimenting with solar heat and insulation as a means of keeping litter dry. Thermopane fronts with overhanging adjustable sunshades and intake and exhaust openings above the windows are used with insulated walls to accomplish the purpose.

[1]Monlux, Wm. S., Bennett, Paul C, and Kingrey, B. W., Pulmonary Adenomatosis in Iowa Cattle. *Ia. Vet.*, 26:11 (Nov.-Dec.), 1955.

Further Studies On The Anthelmintic Action Of Piperazine Citrate†

R. F. SHUMARD, Ph.D., and D. F. Eveleth, Ph.D., D.V.M.,
Fargo, North Dakota††

LABORATORY and field trials on the anthelmintic efficiency of piperazine citrate* in the drinking water of chickens were first reported from this station[1]. Bradley[2] has since reported similar results in field trials with large flocks.

Many products containing piperazine are now on the market. Some producers and/or distributors of these recommend their use for most domestic animals including cattle, sheep, swine, horses, cats, dogs, and poultry. While the danger of toxic reactions from products containing piperazine as the only active ingredient is slight, the anthelmintic efficiency of the compounds in the individual host species named may not have been determined.

Piperazine is not effective against all nematodes. For example, piperazine citrate given in dosages of 4,000 to 8,000 mg. per gallon of drinking water removes only 40 to 60% of *Heterakis gallinae* from chickens. This is not a high degree of efficiency and claims of removal of this species using the above dosages are misleading. In critical tests with piperazine adipate in horses, Downing, *et al.*,[3] found that a dose rate of 220 mg. per kg. of body weight removed nearly 100% of adult and immature *Parascaris equorum* and adult *Trichonema spp.* The same dose eliminated more than 80% of adult *Oxyuris equi* and about 50 to 60% of *Tridontophorus spp.* and *Strongylus vulgaris*, but was *not* effective against *S. edentatus* or *S. equinus*.

The following is a report on experimental trials, field trials, and observations with piperazine citrate in poultry and swine.

1. The Efficiency of Low Doses of Piperazine Citrate in Drinking Water against Ascaridia galli in Chickens.

Thirty-two New Hampshire chicks, six weeks of age, were placed in broiler batteries, eight to a lot. All were fed identical rations. Infective *A. galli* ova were cultured and prepared for administration by the method of Hansen, *et al.*[4]. Ova were administered so that each of the chicks received 10 (±1) ova per day for a period of 15 days. Fifty days following the final administration the birds were treated with piperazine citrate for 24 hours as follows:

Lot 1—no drug, plain water.
Lot 2—2,000 mg. per gal. water.
Lot 3—1,000 mg. per gal. water.
Lot 4— 500 mg. per gal. water.

Forty-eight hours following treatment all birds were killed and the digestive tracts were examined for parasites. Results are shown in table 1.

Compared with the data we reported on dosages of 8,000 and 4,000 mg. per gal.[1] and that reported by Bradley[2] the lowest effective dosage (removing 90% or more of the ascarids) seems to lie between 2,000 and 4,000 mg. per gal. of drinking water.

2. Continual Use of Piperazine Citrate as a Preventive against Ascaridia galli Infections in Chickens

Fifty battery-raised, six-week-old, New Hampshire chicks from the same hatch were placed in broiler batteries, ten to a lot. All lots received the same rations. Treatment and infection were accomplished as follows:

Lot 1—Plain water; infected.
Lot 2—2,000 mg. piperazine citrate per gal. of drinking water; uninfected.
Lot 3—1,000 mg. piperazine citrate per gal. of drinking water; uninfected.
Lot 4—2,000 mg. piperazine citrate per gal. of drinking water; infected.
Lot 5—1,000 mg. piperazine citrate per gal. of drinking water; infected.

Culture and administration of ova of *A. galli* were according to the methods of Hansen, *et al.*[4]. The ova were administered to all chicks to be infected (as noted above) so that they received 10 ova per day on days 1,2,3,5,8,9,14, 15,16,19 and 22 of the experiment, or a total of 110 ova over a period of 22 days.

†From the Department of Veterinary Science, North Dakota Agricultural Experiment Station, Progress Report BJO 85.

††With the technical assistance of D. J. Hanson.

*Acknowledgement is made to E. R. Squibb & Sons for supply of piperazine citrate used in these studies.

Published with the approval of the Director of the North Dakota Agricultural Experiment Station.

All birds were weighed weekly. Fifty days following the initial administration of ova, all birds were slaughtered and examined for worms. Results of necropsies, as depicted in table 2, indicated that at the levels used, piperazine citrate was highly effective in preventing the establishment of *A. galli* infections.

It is presumed that none of the birds died from effects of *A. galli* infection. Necropsies performed showed that one bird in lot 1 and one in lot 5 died from the effects of "pick-out"; one in lot 1 of visceral leucosis; two in lot 1, and one each in lot 2, 3, 4 and 5 of Newcastle disease.

Total group weight gains were calculated. On a percentage basis, calculated from the total initial and total final weights, Lot 1 gained 170%; lot 2, 314%; lot 3, 241%; lot 4, 267%; and lot 5, 238% of their total initial weights. Because of the death of birds due to causes other than *A. galli,* the differences in weight gains can not be said to be due entirely to the effects of piperazine citrate or this nematode.

3. A Field Trial on the Anthelmintic Efficency of Piperazine Citrate in Drinking Water against Ascaridia supp. in Turkeys

A client brought three live broad-breasted bronze turkeys in for diagnosis. The entire flock of 600 birds had been losing weight and were doing a poor job of food conversion. Necropsies revealed all three birds to be heavily infested with *Ascaridia spp.* The flock was treated for 24 hours with piperazine citrate at 4,000 mg. per gal. of drinking water. The owner reported the expulsion of many worms and four days later submitted six birds for examination. Fecal examinations were negative. Upon necropsy, three immature worms were found in one bird and one each in two, with none in the other birds. Thus an average of 0.66 immature worms were found per bird.

This trial indicates that piperazine citrate administered in the drinking water of turkeys may be highly effective against large round worms.

TABLE 1. Necropsy Results: Number of *A. galli* Remaining after Treatment With Piperazine Citrate

Bird No.	Lot 1 Not treated	Lot 2 2,000 mg./gal. H_2O	Lot 3 1,000 mg./gal. H_2O	Lot 4 500 mg./gal. H_2O
1	10	2	0	1
2	11	3	8	4
3	10	2	died*	15
4	9	1	2	2
5	5	0	4	2
6	9	1	0	8
7	10	died*	1	4
8	died*	2		9
Average no. worms/bird	9.1	1.6	2.31	5.6
% Efficiency as compared to control		82.4	74.7	38.5

*All died from Newcastle disease.

4. Tests with Piperazine Citrate for the Removal of Ascaris lumbricoides from Swine

Eight pigs, naturally infected with *Ascaris lumbricoides,* were obtained for the purpose of evaluating the effect of piperazine citrate on this species. The pigs, all from the same drove, ranged in weight from 20 to 34 lb. Fecal examinations revealed all to be positive for *A. lumbricoides* ova. Four of the animals were treated orally with concentrated piperazine citrate at different levels by means of a plastic tube attached to a syringe. Two were given 8,000 mg. piperazine citrate per gal. of water in a slop mixture for a single feeding. The others were not treated. Seventy-two hours following treatment, all pigs were killed and their digestive tracts examined for worms. Table 3 shows the results and dosages. Figure 1 shows the worms recovered from the intestines of three of the pigs given oral dosages. No attempt was made to recover worms that were passed following treatment as facilities

Fig. 1. Ascarids recovered from pigs 72 hours after treatment with 170 mg. piperazine citrate per kg. body weight (left), 270 mg./kg. (right), and untreated (center). Others treated with 430 and 730 mg./kg. respectively contained no worms.

TABLE 2. Necropsy of Experimental Chickens

Lot no.	Mg. of Piperazine/ gal. H_2O/ day	Total No. of ova Administered	Av. no. of mature worms	Av. No. of immature worms
1	0	110	1.3	6.2
2	2000	0	0	0
3	1000	0	0	0
4	2000	110	0	0.1
5	1000	110	0	0.25

TABLE 3. Necropsy Results of Pigs Treated With Piperazine Citrate

Pig no.	Dostage	How Admin.	Mature worms	Immature worms
1	No drug		42	21
2	No drug*		6	8
3	170 mg./kg.	oral, 1 dose	0	2
4	270 mg./kg.	oral, 1 dose	0	2
5	430 mg./kg.	oral, 1 dose	0	0
6	730 mg./kg.	oral, 1 dose	0	0
7	570 mg./kg.	in slop, 1 feeding	0	1
8	670 mg./kg.	in slop, 1 feeding	0	0

*Necropsy revealed severe necrotic enteritis.

were not available at this time. No toxicity was noted.

Within the limits of the experiment described, piperazine citrate appears to be effective against *A. lumbricoides.*

Summary

Laboratory trials with piperazine citrate indicate that high anthelmintic efficiency against *A. galli* is obtained between 2,000 and 4,000 mg. per gal. of drinking water. Preventive levels as low as 1,000 mg. per gal. of drinking water per day were highly effective in preventing the establishment of *A. galli.*

A field trial, using piperazine citrate in the drinking water at 4,000 mg. per gal., was apparently successful in removing ascarids from turkeys.

Single doses of 170, 270, 430 and 730 mg. of piperazine citrate per kg. of body weight were effective in removing *A. lumbricoides* from swine. Dosages of 8,000 mg. per gal. of water in a slop mixture were also effective.

REFERENCES

1. Shumard, R. F., and Eveleth, D. F., A Preliminary Report of the Anthelmintic Action of Piperazine Citrate on *Ascaridia galli* and *Heterakis gallinae* in Hens. *Vet Med.*, 50:203, 1955.

2. Bradley, R. E., Observations on the Anthelmintic Effect of Piperazine Citrate in Chickens. *Vet. Med.*, 50:444, 1955.

3. Downing, W., Kingsbury, P. A., and Sloan, J.E.N., Critical Tests with Piperazine Adipate in Horses. *Vet. Rec.*, 67:641, 1955.

4. Hansen, M. F., Olson, F. J., and Ackert, J. E., Improved Techniques for Culturing and Administering Ascarid Eggs to Experimental Chicks. *Exp. Parasitol.*, 3:464, 1954.

▼ ▼ ▼

Shocking Losses due to Mastitis

In spite of wide circulation of sensible, well founded mastitis control programs and the efficacy of recently developed therapeutic agents, bovine mastitis takes a shocking toll.

Losses in Wisconsin alone are estimated to total $50,000,000. annually, $35,000,000. as a result of milk loss. One in every four cows in the state is infected to some degree. On a herd basis, this cost is about $25. per month for the average 20-cow dairy herd, according to information contained in the annual report of the Wisconsin Agricultural Experiment Station.

Mastitis has been subjected to exhaustive study and successful control measures have been reported time and again in many publications. Facts developed have provided adequate information to limit the shadow of disease, now grown to amazing proportions.

Why does mastitis continue to plague the dairy industry? Perhaps there are a number of reasons. One that must be counted among the first is that there is no single recommended and approved method of treatment by the profession. What is needed is organizational support of set of fundamental rules which are given the stamp of professional approval and the caution that variation from such fixed management procedures practices is at the risk of loss from infection.

▼ ▼ ▼

California Issues Poultry Inspection Regulation

The California Department of Agriculture has adopted regulations pertaining to inspection of poultry for wholesomeness and poultry processing plants for sanitation, according to *Nulaid News,* July-Aug. 1956.

These regulations spell out construction and operating standards for all poultry and rabbit slaughtering establishments. Poultry plants are licensed following inspections. All classes of fowl and rabbits are required to be processed under supervision of the state by poultry meat inspectors licensed by the California Department. A detailed list of diseases for which carcasses will be inspected has been prepared as have marking instructions for final products or packages. Regulations do not apply to plants operating under federal inspection.

Electricity A Potential Hazard To Farm Animals

CAPT. CHARLES T. BUSH,* V.C., U.S.A.F.

SEVERAL years ago during the anthrax outbreak in southern Florida I was called out to investigate the sudden death of a dairy cow.

The incident actually involved five heavy springers confined in a dry lot, and fed on hay and grain. Three of these exhibited depression and anorexia. The fourth animal appeared normal.

An examination of the fifth and dead cow revealed a fat, grade Guernsey slightly bloated with a pronounced generalized rigor mortis. The animal lay on her back in the thin mud some 18 in. from the water drinking trough.

Body openings were free of bloody exudate. Careful incision through the abdominal wall revealed a normal appearing spleen. Further examination of gross characteristics of carcass organs gave no clue as to mode of death except for the unusual looseness of the rumen lining. Patches of brown mucous membrane came away with a slight tug. Apparently some strong force or destructive agent had seriously damaged the rumen mucosa loosening it from the two muscular layers.

The attendant stated the dead animal had eaten normally some 40 minutes prior to my visit. This dry lot, he stated, was a "bad luck lot" for every year on confining newly purchased animals, unexplained losses occurred. Treatment had been in vain.

With this information to consider I carefully examined every foot of the lot. As I stood near the pressure tank resting my gaze on the centrifugal pump there was a screech of slipping V belts as the motor came to life.

I was surprised to see, for several seconds, sparks hissing and jumping as extreme reciprocal vibration caused a bare hot wire to contact the metal motor base. Then the vibrating stopped and a normal pumping operation continued. My immediate reaction was curiosity regarding the fusing in the motor circuit. Examination of the ancient switch box, which was nearly full of spider webs and mud dauber nests brought forth the answer to this question in the form of two blackened copper pennies under the fuses.

A supply pipe ran on the dry lot surface some 150 ft. to the water drinking tank. Here a leaky float valve allowed water to run over and form a thin mud which spread for about ten feet in all directions.

An electrical engineer who reviewed the pump installation swore that every time these confined animals drank they were unwittingly playing a sort of Russian roulette and betting that the pump would not start up.

This statement stimulated the herdsman's mind for he quickly recalled an incident at the same drinking fountain involving a riding horse. The animal, while drinking, began to dance stiff-legged, tossing the rider to the ground. As he arose from the mud, his arms tingled from the palm to elbow, but being hot-tempered he forgot the sensation in his haste to punish the animal.

To conclude the above incident the three cattle mentioned previously were given intravenous dextrose, stimulants, and gastro-intestinal protectives. They recovered, freshened, but never reached a profitable lactation, and were soon sent to the butcher. The fourth animal in the lot freshened and milked heavily.

Examining some old case records I noted that on one occasion I was called to a farm to prescribe for a dairy cow exhibiting anorexia and great depression. The herdsman said, "that cow hasn't eaten a bite since we pulled her out of the pump house with the tractor." The pump house was a dark, damp, narrow concrete block affair completely open at one end. Exposed switches and bare wire made the building a bovine trap.

Wishing to force feed the animal I passed a colt-size rubber tube. On withdrawal something was noticed protruding from the end of the tube. It was a piece of rumen mucosa which when stretched out measured 2″ x 3″. When tensed gently it was so soft it pulled apart. I recommended the animal be sent to the local slaughterhouse where a meat inspection service was offered. The owner refused to take this advice and later on I heard that despite the treatment given the cow died. It is my opinion that this animal died as a result of an initial electric shock.

(Continued on page 522)

*Base Veterinarian, R.A.F. Station Brize Norton, Oxfordshire, England.

Effect Of Passive Immunity, Mode Of Inoculation, And Dose Of Virus On Immunity Response In Bronchitis†

F. R. BEAUDETTE, D.V.M., D.Sc., J. A. BIVINS, B.S., D.V.M., M.S., HELEN E. BURD, B.S., and C. B. HUDSON, B.S., M.S.,
New Brunswick, New Jersey

THE objective of this experiment was essentially the same as that of a previous work[1] with Newcastle disease. Here, however, the immunity response was determined by serum neutralization (SN) tests rather than by the hemagglutination inhibition (HI) tests of the earlier experiment.

Materials and Methods

Immune Serum. Each of three pullets was given 0.4 cc. intratracheally and 0.4 cc. intramuscularly of non-diluted amnio-allantoic (a.a.) fluid of the 24th passage of an allantoic-sac-passage strain (Wachtel strain) of bronchitis virus. The injections were made on the day the fluids were harvested. Five days later, on February 9, the birds were reinjected with the same virus in a dose of 0.75 cc. by each route. On March 2, the birds were bled and the sterile serum pooled. A second bleeding was made on March 4 which constituted a second pool. One of the three birds was bled a third time on March 9 and the other two on March 10 to make a third pool.

Chicks. The original lot of 163 chicks was hatched January 26. Only one person cared for the chicks grown in a battery in the isolation house and no symptoms of disease were noted until chicks were used in the experiments.

Immunizing Virus. A pool of a.a. fluids from five eggs of the 73rd passage (B 2230, 32, 34, 37, and 39) harvested January 28-29, 1954, was used. This is the original strain of bronchitis virus isolated in this laboratory and described in 1937[2].

Challenge Virus. This was a pool of a.a. fluids of four eggs (Br. 53 and 54), harvested 2/1-2/54 (25th passage) and Br. 43 and 46, harvested 3/4/54 (26th passage) of the Wachtel strain. The dose of virus used was 0.1 cc. into the nasal cleft and 0.1 cc. intratracheally.

Arrangement of Experimental Birds. One room contained the eight birds which were to receive virus intramuscularly. Each bird was bled on March 3 and four were immediately given 2 cc. each of immune serum from pool 1. On March 4, the four birds which had received serum the previous day were bled again and each bird was given 0.2 cc. of virus intramuscularly, non-diluted or diluted 1-100. The birds were treated and housed in duplicate, that is, the two which received serum and non-diluted virus were in one cage and the two which received serum and a 10^{-2} dilution of virus were in a second cage. The third cage contained two birds which received only non-diluted virus, while the fourth cage contained two birds which received only 10^{-2} dilution of virus.

Eight birds were also kept in a second room and their treatment duplicated that of the birds in the first room except that in this case the dose and dilutions of virus were given by way of the respiratory tract — about 0.1 cc. intratracheally and 0.1 cc. in the nasal cleft.

Six control birds were kept in a third room. The four kept in cage 1, were bled on March 3 but received no serum. The two kept in cage 2 each received 2 cc. of serum immediately after being bled on March 3. When one of the birds in cage 2 (no. 47) was killed during the March 4 bleeding, it was replaced by two birds (no. 65 and 88) which were not given serum until March 11 when each was injected with 2.5 cc. of pool 3. Finally, two birds were kept in a battery room but they were not bled on March 3 and did not receive serum until March 5.

The controls received no immunizing virus but an original intention to inject them with a challenge virus was apparently not executed, because there was no serological evidence that they had been inoculated, nor could virus be recovered from them.

Examination for Virus. Every intramuscularly and intranasally inoculated bird was exam-

†Paper of the Journal Series, New Jersey Agricultural Experiment Station, Rutgers University, the State University of New Jersey, Department of Animal Pathology, New Brunswick.

ined for virus on March 5 (the day after inoculation) and again on March 8, 11, 15, and 22, that is, on the 4th, 7th, 11th, and 18th days postinoculation. Several, but not all, of the controls were examined for virus on March 8, 11, 15, and 22. The inoculated birds were challenged immediately after the March 22 swabbing and post challenge swabbings were made on March 24, 26, and April 7.

Material for virus examination was collected as follows: The bird was restrained in a large cone with head down. A 5 cc. Luer syringe containing 3 cc. of saline and fitted with a plastic tube 1 cm. in length was used to flush 1.5 cc. of saline through the nasal cleft in the direction of one nostril and the remainder in the direction of the other nostril. The washings that escaped through the nostrils were collected in a 15 x 85 mm. tube fitted over the upper beak. Finally, a swab was introduced the length of the trachea and shaken in the collected nasal washing. A separate plastic tube was used for each bird. Each sample was then centrifuged and the supernatant fluid measured and put into another tube in order that 10 mg. of streptomycin and 10,000 units of penicillin could be added to each cc. collected. The sample was then frozen until inoculated into embryonating eggs. Each sample was inoculated into four embryonating eggs. A second passage was made from any embryo that had died after 24 hours, or from any live embryo which after seven days' incubation showed dwarfing, curling, or any other change characteristic of this strain of virus.

Bleedings for SN Test. As already stated, all birds except the two in the battery room and two of the three on room 3, cage 2, were bled at the start of the experiment March 3. Only those which received serum on March 3 were bled March 4. Other bleedings of inoculated birds were made March 8 and 22 with a postchallenge bleeding April 7.

The SN tests were made by incubating a constant dose of virus with varying dilutions of serum and inoculating four embryonating eggs with each dilution. The eggs were incubated seven days after inoculation. Several SN tests had to be done on some samples because the range of dilutions used did not establish the end point.

Results and Discussion

The results, except symptoms noted, are given in table 1.

Of the birds in room 1 which had been injected intramuscularly, none exhibited any symptoms prior to challenge except one unidentified bird that sneezed on March 9 and two (no. 11 and 36) that seemed less active on March 17. These observations are in accord with the serological results and the attempts to recover virus.

After the challenge on March 22, one (no. 73) exhibited wet nostrils on March 27. Another (no. 18) showed questionable symptoms on March 24, a dry sneeze on the 26th, and by the 28th was blowing bubbles from the nostrils. Bird 49 had a definite sneeze by March 24, and No. 93 exhibited moist rales by the 26th. No. 4 had a slight "tick" on the 24th and sneezed occasionally on the 26th and 27th. A dry sneeze was detected in no. 7 on the 25th and 28th, and it showed a plugged nostril on the 27th. No. 36 had a dry sneeze on the 25th and no. 11 a wet nostril and sneezing on the 27th. Thus, in the intramuscularly inoculated group no bird showed any evidence of respiratory infection during a period of 18 days postinoculation. Every bird, however, exhibited symptoms after the challenge.

The only prechallenge symptoms shown by the eight birds in room 2 injected intranasally with the modified strain were a dry sneeze by no. 85 on March 9 and 14 and in no. 51 on March 14, and a sneezing in no. 24 on March 9. In the same birds after challenge, an unidentified bird sneezed on March 24, and on March 26, no. 85 was sneezing and exhibiting moist rales. No other symptoms were noticed in this group thereafter.

As already stated, although symptoms observed in the controls from March 23 to 29 indicated they had been challenged according to plan, the serological results and the search for virus were definitely negative. In any event, no. 96 showed a wet sneeze on March 25 and wet nostrils on the 28th and 29th. No. 31 showed a dry sneeze only on March 26. No. 50 exhibited no symptoms, while no. 79 sneezed on March 24 and 25, exhibited moist rales on the 26th and wet nostrils on the 29th. No. 88 was hoarse from March 24 to 26, and no. 74 sneezed violently on March 26. No. 83 was hoarse on March 25 and sneezed on the 26th as did no. 37. No. 65 died before it was challenged.

The preinjection SN values on the birds tested indicates that they carried no appreciable immunity either parentally acquired or as a result of a previous experience with the virus. Nor did the immune serum injected appear to have more than slight influence on the titer. The intramuscular injection of this strain of modified virus was not followed by respiratory tract infection as indicated by the prechallenge

swabbings made on March 3, 8, 11, 15, and 22. Moreover, there was no serological evidence of response. That these results are significant is borne out by the fact that after the eight birds were challenged by way of the respiratory tract, seven yielded virus on a later swabbing. Four of the seven positive birds yielded virus on both swabbings (March 24 and 26) while three yielded virus only on the March 24 swabbing. No bird yielded virus on the April 7 swabbing, that is, 16 days after challenge. The SN value 16 days after challenge, except in one bird (no. 11), did not indicate a good immunity response.

In the intranasally inoculated group the results of the examinations for virus are the reverse of the above. Of the eight birds inoculated with modified virus, six yielded virus, four on both swabbings (March 3 and 8) and two only on the March 8 swabbing. The two birds which failed to yield virus had received a 10^{-2} dilution, one preceded by serum, the other not. The prechallenge swabbings on March 11, 15, and 22 were negative in all cases. Again, the SN values determined 18 days after inoculation were not perceptibly higher than in the group inoculated intramuscularly. In spite of negative serological evidence of refractivity, only one of the eight birds (no. 60) yielded virus after the challenge on March 22. The positive swab was that on March 26, and interestingly enough,

TABLE 1. Showing Results of Virus Isolation from Respiratory Tract after Intramuscular and Intranasal Inoculation with Modified Virus and after Challenge Together with SN Values.

Room	Cage	Bird No.	SN Value 3/3/54	Serum 3/3/54	SN Value 3/4/54	0.2 cc Virus 3/4/54	Virus in Resp. Tract on 3/5	Virus in Resp. Tract on 3/8	SN Value 3/8/54	Virus in Resp. Tract on 3/11	Virus in Resp. Tract on 3/15	SN Value 3/22/54	Virus in Resp. Tract 3/22/54	Chall. 3/22/54	Virus in Resp. Tract on 3/24	Virus in Resp. Tract on 3/26	Virus in Resp. Tract on 4/7	SN Value 4/7/54
1	1	73	10	2 cc	25	10-0 M(5)	—	—	25	—	—	< 5	—	0.1 cc Intranasally and 0.1 cc Intratracheally	+	—	—>	20
		18	10		25		—	—	<25	—	—	< 5	—		+	+	—>	20
	2	48	10		25	10-2 M	—	—	25	—	—	5	—		—	—	—>	20
		93	10		25		—	—	<25	—	—	< 5	—		+	+	—	10
	3	4	1	None		10-0 M	—	—	<25	—	—	< 5	—		+	—	—	10
		7	0				—	—	< 5	—	—	< 5	—		+	+	—	10
	4	36	1			10-2 M	—	—	< 5	—	—	< 5	—		+	+	—>	20
		11	1				—	—	< 5	—	—	< 5	—		+	—	—>	500
2	1	56	0	2 cc	25	10-0 N(6)	—	+	< 5	—	—	<10	—		—	—	—>1000	
		8	1		25		+	+	< 5	—	—	10	—		—	—	—>	500
	2	92	0		25	10-2 N	—	—	< 5	—	—	<10	—		—	—	—>1000	
		85	0		25		+	+	< 5	—	—	20	—		—	—	—>1000	
	3	16	0	None		10-0 N	+	+	< 5	—	—	<10	—		—	—	—>1000	
		51	1				+	+	<50	—	—	<10	—		—	—	—>1000	
	4	60	1			10-2 N	—	—	<50	—	—	<10	—		—	+	—>1000	
		24	0				—	+	<50	—	—	<10	—		—	—	—>	500
3	1	96	0	None		None		—	<50	—		< 5	—	None	—	—	—<	10
		31	0					—	<50	—		< 5	—		—	—	—<	10
		50	0					—	<50	—		< 5	—		—	—	—<	10
		79	0					—	<50	—		< 5	—		—	—	—<	10
	2	74	0	2 cc (1)	25 (2)	None		—	< 5	—		< 5	—		—	—	—<	50
		88		2 cc (1)	5 (2)				10 (4)			< 5	—		—	—	—<	50
		65		2 cc (1)	<5 (2)				< 5 (4)	Died 3/15								
4	B	83		2 cc (3)		None		—	< 5		—	< 5	—		—	—	—<	50
		37						—	< 5			< 5	—		—	—	—<	50

(1) Injected 3/11; (2) Bled 3/11; (3) Injected 3/5; (4) Bled 3/15 and died immediately; (5) M = Intramuscular; (6) N = Intranasal.

this was one of the two birds which did not yield virus after the original injection of modified virus.

The SN values of samples collected 16 days postchallenge indicate a good immunity response in contrast to the previous group. The obvious explanation of this difference seems to be that whatever immunity was stimulated in the group injected intramuscularly, developed in the 16 days after the challenge and might have been higher if the determinations had been delayed, whereas in the respiratory tract inoculated group there was a response provoked by the modified virus which protected all but one of the birds against the challenge which merely served to increase the response.

Unfortunately, we have no way of determining whether the control birds were actually challenged or not. The few swabbings and the SN determinations made prior to the challenge date were negative, as were all swabbings after the challenge date. The final SN values do not indicate a response but neither do those of the group primarily inoculated intramuscularly and which, after challenge, yielded virus in the case of seven of the eight birds. Of the eight control birds remaining on the challenge date, seven exhibited symptoms thereafter although no virus was recovered at any swabbing. The only possible explanation seems to be that the symptoms resulted from a spread of the challenge strain, and that this was not detected by virus isolation because of the low concentration of virus on March 24 and 26 and its disappearance by April 7. The eight control birds and no. 85 were tested for hemagglutination inhibition antibodies for Newcastle disease and none inhibited 40 units, the lowest dilution tested.

Summary

The strain of modified bronchitis virus used did not provoke a serological response during a period of 18 days after intramuscular inoculation nor was it recoverable from the respiratory tract in swabbings made 1, 4, 7, 11, and 18 days later. When challenged by way of the respiratory tract on the 18th day, all birds exhibited symptoms and the virus was recoverable from seven of eight birds; by the 16th day, however, except for one bird, there was no appreciable immunity response. On the other hand, the modified strain was recovered from six of eight birds infected by way of the respiratory tract but in 18 days it did not produce any serological response. A resistance seems to have developed, nevertheless, since only one bird yielded virus on swabbing on the fourth day after respiratory tract challenge, and this was one of the two birds which failed to yield virus after respiratory tract inoculation with modified virus. Moreover, the serological response in the 16 days after challenge was in marked contrast to the response to challenge of birds previously injected intramuscularly with modified virus.

REFERENCES

1. Beaudette, F. R., and Bivins, J. A., The Influence of Passive Immunity on the Response to Intramuscular and Intranasal Administration of Newcastle Disease Virus. *Cornell Vet.*, 43:513 (Oct.), 1953.

2. Beaudette, F. R., and Hudson, C. B., Cultivation of the Virus of Infectious Bronchitis. *Jour. Am. Vet. Med. Assn.*, 90:51 (Jan.), 1937.

▾ ▾ ▾

Electricity a Potential Hazard

(Continued from page 518)

While administering to animals on the farm the veterinarian should keep his mind open and when dangerous electrical installations are noted should counsel the farmer. It is not unusual to see home constructed electric fences delivering 110 volt 60 cycle shocks.

The veterinarian should be able to explain how a simple high tension induction coil operates. He should know that there is no direct wire connection between the primary coil windings and the fine, numerous, secondary coil windings.

He should be able to explain that when the primary circuit is interrupted the electromagnetic lines of force cutting through the secondary windings induce a sudden hot, but harmless shock in the secondary circuit. Although this force is high in voltage, so high it can jump a small gap, it is low in amperage and momentary contact can stimulate but is not able to seriously damage or kill cells or cause fibrillation of the heart.

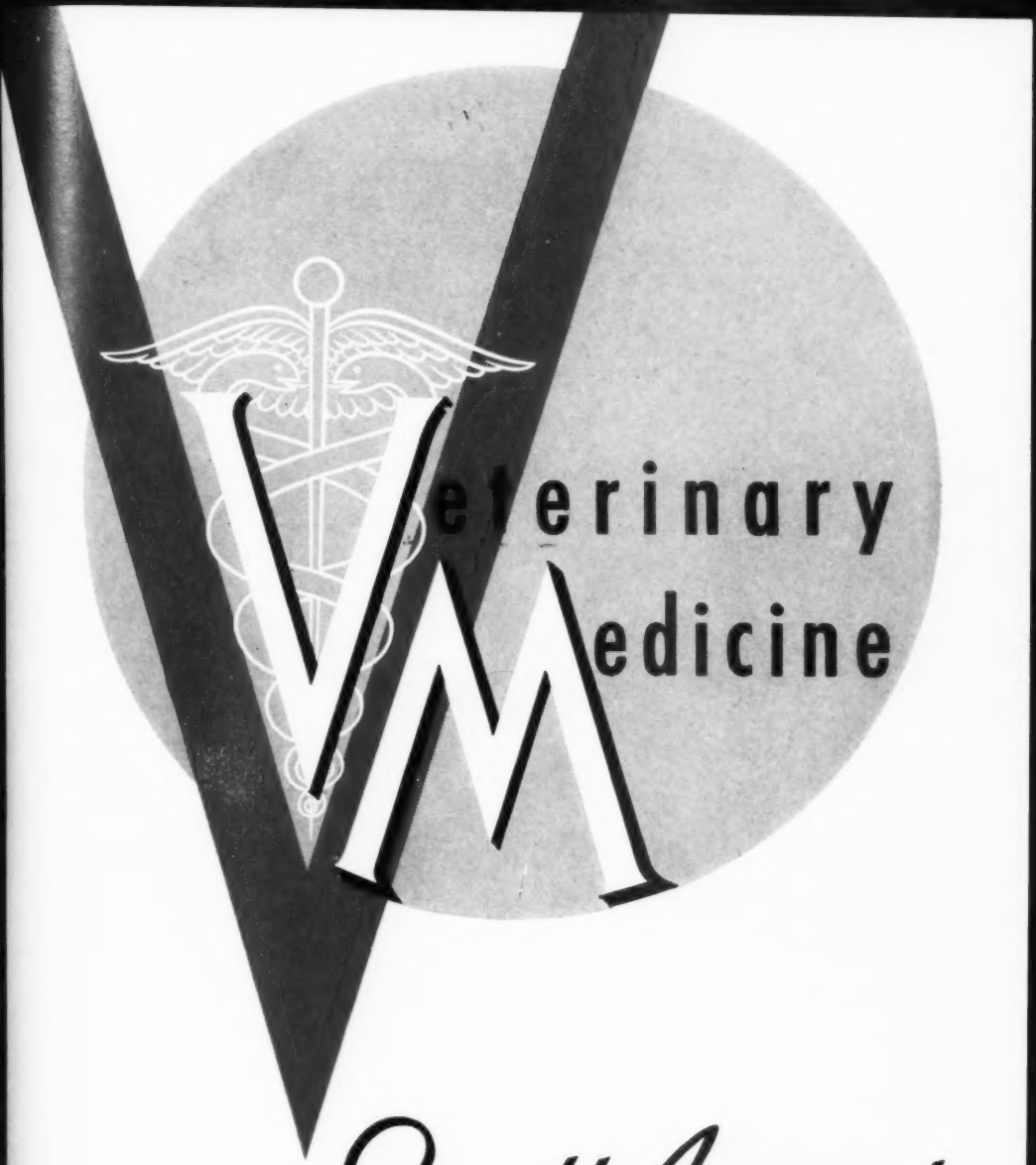
▾ ▾ ▾

Arizona Serotypes

Four new Arizona serotypes, isolated from reptiles, river water, and a chicken, are described by P. R. Edwards and Alma C. McWhorter of the Communicable Disease Center. Attention was called to the marked serologic relationships of these cultures to Salmonella types.

▾ ▾ ▾

Loss to the dairy industry because of breeding failures has been estimated at $250,000,000. to $300,000,000. annually.



Small Animal

SECTION

THERAPEUTICS • MEDICINE • SURGERY

WHICH LOCKHART RABIES VACCINE SHOULD YOU USE?

CHICK EMBRYO ORIGIN

Modified Live Virus Rabies Vaccine prepared from the Flury strain of rabies virus, modified in virulence by passage in chick embryos.

This modified strain has demonstrated high immunizing ability in extensive field trials.

For use only in the immunization of healthy dogs against rabies.

OVINE ORIGIN

A sterile, neutral, phenolized 20% suspension prepared from the brain and spinal cord of animals showing typical symptoms of rabies following subdural injection of the fixed virus of rabies.

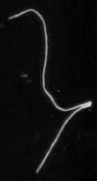
For the immunization of dogs and other animals against rabies.

YOU MAKE THE CHOICE!

LOCKHART

Lockhart now offers both vaccines for your consideration . . . you make the choice!

ASHE LOCKHART, INC.
800 WOODSWETHER ROAD KANSAS CITY 6, MISSOURI



Chronic Solar Dermatitis Of The Dog

FRANCIS T. CANDLIN, D.V.M., Denver, Colorado

CHRONIC, solar dermatitis of the dog is a congenital, abnormal reaction of the skin to sunlight. It is a disease of Collies, Shetland Sheep Dogs, and mixed breeds closely related to these two breeds. It affects only the nose and the eyes and the areas adjacent to them, and is commonly referred to as "Collie nose."

Etiology

The actual cause of this disease is a peculiar susceptibility of these breeds to the reaction of the skin to sunlight. The exact reason for this susceptibility is unknown. Perhaps it is wise, at this point, to review Kesten and Slatkin's schematic classification of diseases related to light-sensitivity as seen in man.

1. *Those occurring in Apparently Normal Skin.*

(a) Solar erythema

(b) Chronic, polymorphic, light dermatitis —the eczema type and the pruritic type

(c) Solar urticaria, produced by ultra-violet light and infra-red light

(d) Photodynamic dermatoses

2. *Those Occurring in Presumably Abnormal Skin.*

Among these are porphyria, light-sensitivity associated with infection and light-sensitivity associated with endocrine disturbance.

3. *Those Occurring as the Koebner Phenomena.*

Some of these are pellagra, pellagroid eruptions, lupus erythematosis, papular urticaria, scleroderma and psoriasis.

4. *Those Occurring in Sunlight after Prolonged Exposure.*

Chronic sunburn.

Thus far, it appears that this particular anomoly in the dog falls into the following classifications: (1) Chronic, polymorphic, light-dermatitis, of the eczema type. The eczematous-like eruptions in light sensitive patients include many morphologically similar lesions. The eczematous type includes the localized plaques of dermatitis occurring principally in the West and Southwest parts of the United States, to which have been given the names, contact dermatitis type, eczema solare, et cetera, or (2) the group comprising the dermatoses of light sensitive patients with inherited abnormalities, disturbances in porphyrin or endocrine metabolism. Because of frequent association of abnormal quantities of types of urinary porphyrins with light sensitivities, these terms are defined; porphyria and porphyrinuria.

Porphyrins in various complex arrangements, acting as respiratory pigments, form one of the most important systems found throughout plant and animal life. Normally, less than 300 units daily of coproporphyrin, types 1 and 3, is eliminated in the urine. Excretion of urinary coproporphyrins in excessive amounts is termed porphyrinuria. It is often associated with disturbed liver function. The appearance of uroporphyrins in the urine, except in traces, is a requirement for the diagnosis of porphyrinuria. A tendency to excrete abnormal kinds and amounts of porphyrin is inherent, and often familial, in persons with porphyria. Its activation, either early in life, or in adulthood, may be linked with skin lesions which are adversely affected by sunlight. In this group falls the classic geeldikopf, which has been

Fig. 1. Chronic solar dermatitis in a mature Collie. Note erythema, epilation, encrustation, and depigmentation. This case was advanced and persistent.

so well described in South Africa in veterinary medical literature. Also in this group falls xeroderma pigmentosa. The evolution of lesions in patients with xeroderma pigmentosa suggests a photosensitivity in this disease. However, efforts to demonstrate the presence of photodynamic substances in the blood or urine have been almost uniformly unsuccessful. Although characteristic lesions have not been reproduced experimentally, extensive investigations on the few human patients have, at times, demonstrated an increased sensitivity of the skin to the sunburn spectrum. Persistent pigmentation and erythema with telangiectases follow erythema produced by ultraviolet light. It may be that sunlight accelerates the disease process in this inherited abnormality.

In light sensitivity associated with endocrine dysfunction, the successful treatment of a variety of light sensitive eruptions with steroid and gonadotropic hormones suggests that the normal steroid metabolism may be interfered with by abnormal reactions to sunlight, or that sensitivity to sunlight may occur in patients with abnormal steroid metabolism. Low level testosterone in the skin may cause incomplete enzymal reactions to the melanin system, which may account for the depigmented, or pinkish color of many lesions due to allergenic light-sensitivity associated with endocrine upset.

Photodynamic dermatoses are those which are associated with various substances which produce sensitivity of the skin. This includes a wide variety of drugs and porphyrins, those taken internally and those applied externally, and all those associated with the various plants, An example of this is the disease of domestic animals, particularly sheep, due to photosensitivity following the eating of St. John's Wort. This is also described in detail in veterinary medical literature.

Photochemical dermatoses are those which are directly associated with the application of chemicals.

Koebner's Phenomena. In this group are placed the disease of patients with nutritional or hereditary disease and skin lesions with distinguishing dermatological morphology, in whom lesions characteristic of the disease have been produced by sunlight. In some diseases of man associated with sensitivity to light, for example, porphyria pellagra and lupus erythematosis, there is evidence of disordered hepatic function. In many respects, the mechanism of the action of photosensitive dermatosis is still a deep mystery.

Symptoms

The disease runs a slow, insiduous course. Onset is usually so minor as to cause little concern with the client. Usually, after several months, or even years, of minor irritation of the nose, the client will call to the veterinarian's attention that the nose appears irritated. Even more often, the veterinarian is apt to call the owner's attention to a chronic dermatitis involving the area of the nose. The owner's explanation is usually, "I think he must get it from rubbing his nose in the dirt." Yet, when questioned, they are not too sure that they have ever seen the dog do such a thing.

Careful examination will usually reveal, in addition to the nasal irritation, an associated conjunctivitis and blephoritis. In many cases there is also a mild gingivitis.

The initial lesion usually appears at the junction of the hairless, or black, part of the

nose with the skin which has hair. A mild erythema appears at this point, with an associated, mild case of alopecia. Small areas of leukodermia may appear in the heavy-pigmented portions. Some of these are only pinpoint in size. As the disease increases in severity, exfoliation begins to form on the bridge of the nose, and this is gradually followed by a crusting and peeling process. Scabs removed usually bleed easily. The area then gradually begins to ulcerate; secondary infection takes place, and finally, ulcerated craters begin to form on the surface. Depigmentation of the black part of the nose continues until it progresses from a mild pink to a fiery red, and exhibits rather small, ulcerated cavities which bleed easily when probed. This inflammation will gradually spread up the

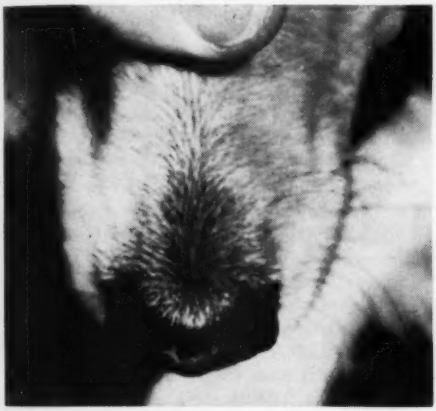


Fig. 2. Progress toward recovery after six months treatment with para-aminobenzoic acid (PABA).

bridge of the nose, until it involves all the periorbital tissue. Eyelids become inflamed and then a mild to severe conjunctivitis becomes manifest. Finally, the whole area becomes a severe, moist, and dry eczematous dermatitis. It seems to alternate all over the nose, with areas of peeling, scaling, and bleeding.

Another important consideration is that lesions vary somewhat between winter and summer. In the summertime, they are well on top of the bridge of the nose, and very well fixed on the upper surfaces of the eyelids. In the wintertime, particularly in areas which are associated with snow, the lesions also appear on the lower surfaces of the upper lip, at the point of the chin on the under-surface, and along the lower mandible. The marginal surface of the upper lid is visibly inflamed. The remainder of the animal's coat and skin looks quite normal. The dog is usually symptom-free, other than the above-described skin lesions. Appetite is usually good. The patient is usually not too much concerned about the skin lesions themselves, as it is not associated with self-infliction. Occasionally, the patient might rub the nose against the furniture, or on the grass, but it is not associated with pruritus.

Diagnosis

Since this disease is so specific to the above-mentioned breeds, the fact of finding dermatitis of the nose associated with leukodermia and erythema is sufficient evidence to warrant diagnosis of the disease.

Treatment

A total of 25 dogs have been treated for this disease. By breeds they are as follows: Shetland Sheep Dogs 9, Collies 6, farm Collies 4, mixed Boxer 1, Cocker Spaniel 3 and Golden Retrievers 2. All of these dogs have been treated between 1951 and 1956. Every dog has been treated at least one year. Three of them have been treated at least four years and five for at least three years. None can be said to be cured. Three of the dogs apparently received no benefit from any type of treatment used. Four were only benefited to a mild degree and the rest were benefited remarkably well. An effective but impractical treatment is keeping the dog away from exposure to sunlight. This advice is much easier to give than to actually carry out, however. Keeping the dog confined indoors except in the early morning and late evening hours will result in improvement. Numerous forms of treatment

Fig. 3. Ulceration, scabbing, and loss of hair and skin pigment of the nose are disease processes noted in this case.

have been suggested, all of which produce a certain amount of symtomatic improvement. The principal reason for this improvement is that in most treatments the drugs, or the therapy applied, controls or destroys the secondary infection. This produces a temporary alleviation of some of the symptoms, but cure is never effected. Lesions gradually return as they were previously, simply because the fundamental, etiological factor can not be controlled.

These treatments include the various dyes, such as Castallani's paint, methylene blue, topical antibiotics, the use of ultraviolet light, *x*-ray therapy and the systemic administration of vitamins and hormones.

More recent treatment involves the internal administration of some of the known sunscreening drugs. The three used in this course of treatment were para-aminobenzoic acid (PABA), atabrine®[1] (quinacrine), and aralen®[1] (chloroquine). Aralen and atabrine are basically powerful antimalarials. It has been demonstrated by several workers, however, that these two drugs do produce improvement in light, sensitive eruptions following their systemic administration. As yet no explanation seems to explain all the factors in the beneficial effects of these drugs on patients with solar dermatitis. PABA is one of the B-complex factors and somewhat related to sulfanilamide and procaine. It has a striking similarity of effects to those of adrenalcorticortropic hormone (ACTH) and cortisone and will usually produce a surprising reduction in the eosinophyl count, one to three hours after administration.

The sun screening action of para-aminobenzoic acid has been known for several years in human medicine and is the basis of most of the "tan lotions and oils" applied topically to the skin. Since topical application is impractical in the dog, particularly on the nose, it is fortunate that the drug also provides similar protection by internal administration. In general no toxic symptoms were noted with the administration of para-aminobenzoic acid. Occasionally a dog would vomit but, when taken off the drug a day or two and then placed back on again, would continue again for several months without difficulty. The main objection to this particular agent is the large amount that is necessary to control the disease. Collies, 50 lb. and over, it is necessary to give 2 gm. four time daily. Smaller Collies and large Sheep Dogs, 20-50 lb., would take 2 gm. three times a day, and in the small Shelty, 1 gm. three times a day.

Aralen (chloroquine) does not appear to be well tolerated by the dog. Two of the three patients treated developed extreme nervousness, exhibited marked anxiety, vomited and had diarrhea. Treatment had to be discontinued.

Atabrine appears as of now to be the most successful drug in controlling symptoms. One 50 mg. tablet administered two times a day in the average dog seems to control the disease rather well. One dog has been on it approximately a year now with no unusual symptoms. This particular dog received one 50 mg. tablet three times a day for approximately three months and is now on a maintenance dose of 50 mg. daily. The dose should be reduced to the minimum daily amount that will control symptoms.

Difference of opinion exists in human medicine as to the toxicity of these drugs. In a

®[1]Winthrop Laboratories, New York, N. Y.
®[2]Schering Corp., Bloomfield, N. J.

Fig. 4. Breeders referred to the condition illustrated as "Collie nose." It appears from observations so far made that the disease might be classified as chronic, polymorphic, light dermatitis of the eczema type.

question presented in the queries and minor notes *(Jour. Am. Med. Assn.)* two opinions were given as to how long one would be able to continue treatment. One authority states that the drug should be discontinued for three or four weeks if the lesions are doing well with a continuation of blood counts and urinalysis during this time. All treatment may then be stopped if the lesions are under control. A second consultant says that atabrine should be continued as long as necessary provided close observation is maintained for the development of intolerance.

While nearly all clients noted improvement in their dogs, many of them were discouraged in the necessity of having to administer treatment for prolonged periods even lifetime. Some find it convenient to treat the dogs only during the more serious periods of the year when snow is on the ground and lots of light reflection is present and during the summer months when the number of hours of sunlight are longest.

In our experience, the corticosteroids definitely assist in controlling symptoms. The oral administration of fluoroalphahydrocortisone and clorohydrocortisone, 3 to 5 mg. twice daily and meticorten®[2], 5 mg. two or three times a day did appear to relieve symptoms that could not be completely controlled with the antimalarial drugs.

Further work should certainly be done to determine why the apparent congenital susceptibility of many of these breeds to light sensitivity. An effort should be made to avoid reproducing animals which are showing these symptoms. In our experience two of the Shetland Sheep Dogs have sired litters which are now exhibiting symptoms and three females have had litters, members of which are now affected.

▾ ▾ ▾

Rural and Urban Ringworm

A current report by Georg, Hand, and Menges in the *Journal of Investigative Dermatology* presents some epidemiologic difference between rural and urban outbreaks of ringworm. In general, rural ringworm is of animal origin. Human lesions occur in both adults and children, and are never epidemic problems. Lesions tend to be suppurative and generalized; reactions are seen occasionally. Two species, *Trichophyton verrucosum* and *Trichophyton mentagrophytes* (granular type) are the principal causes of rural ringworm in the United States. *T. verrucosum* infections are directly related to contacts with ringworm-diseased cattle. Rural *T. mentagrophytes* infections are probably contracted from direct or indirect contacts with a variety of animals, including rodents which the authors discuss.

Urban ringworm is divided between human epidemic types and ringworm contracted from cats and dogs. The two species which cause epidemic ringworm are *Microsporum audouini* and *Trichophyton tonsurous.* Infections contracted from cats and dogs are usually due to *Microsporum canis.* An unusual epidemic of *T. tonsurous* in northeastern Michigan is described. The disease previously unknown in this area has become endemic in sections where migrant workers have settled. *T. tonsurous* does not affect animals according to present information.

▾ ▾ ▾

Canine Blood Types

Lawrence and coworkers in the hematology laboratories of the University of Rochester New York Medical Center have determined that approximately 40% of all dogs have "universal donor" canine blood that they have designated "A-negative." In general, for canine blood this corresponds to the type "O" blood of the human universal donor. Since before blood transfusion is resorted to in the treatment of canine conditions the operator must be certain that the blood used matches that of the recipient, the A-negative type may be used before immediate or spur of the moment preliminary typing provided a blood-bank of A-negative blood is maintained for instant use. It is said that much more frequent bleeding from a donor is permissible, if after centrifuging the solid separated portions are returned to the donor—the plasma only used for transfusions.

▾ ▾ ▾

Schering to Hold Veterinary Conference

The first Veterinary Symposium on the uses of Meticorten and Meticortelone will be sponsored by Schering Corporation on November 29th and 30th at the Hotel Commodore in New York. Nineteen new clinical papers on meti-steroids will be presented by nationally known veterinarians, according to announcement by Dr. J. C. Siegrist of the firm's Department of Veterinary Medicine.

Graduate Veterinarians from throughout the United States are invited to attend the two-day program which will be devoted to the uses of meti-steroids in both large and small animal practice.

Approaching Canine Dentistry†

T. H. BRASMER, D.V.M., Danville Illinois

IT is axiomatic in veterinary literature that the common-place is forgotten while the exotice receives emphasis. No routine physical examination of a pet is complete without at least a cursory examination of the teeth. Yet little has been said or written about canine dentistry since Lacroix first described dental blocks in 1934. It is not the intent of this paper to reveal new or exciting knowledge. But a recent survey of practitioners specializing in small animal practice reveals that many are still using outdated methods[1]. Surely 20 years should have brought us to improved technics better suited to modern dental surgery.

Some considerable interest has been manifest in geriatrics during recent years. Since severe dental problems occur only infrequently in the young dog, the major problem in dentistry might well be called oral surgery of the aged. If recent statistics and observations by many practitioners are accurate, life span of dogs is showing a marked upward trend. The following methods and statistics represent the views of the author and material compiled from a questionnaire circulated to over 300 small animal hospitals.

Preoperative Preparation

Many hospitals have difficulty in maintaining a definite operative schedule. Clients frequently request oral surgery — minor or major — while a dog is hospitalized for grooming, clipping, bathing, et cetera. Because these are usually aged dogs, a rush and hustle technic may prove fatal. Three or four days of preoperative preparation, usually as an out patient is advisable and may prove lifesaving. Such simple procedures as digitalization, administration of preoperative antibiotics, oral hemostatic agents, and evaluation of the renal function may save embarassment. It is an unusual owner who is reluctant to give an elderly dog this extra care. These simple precautionary procedures may also differentiate those who just pull teeth and the oral surgeon.

In some cases consideration of the diet program and a prescribing low protein diet, such as k/d®[1] or a similar diet, for at least seven to ten days will relieve renal load to better meet the stress of anesthesia. The vicious cycle of abscessed teeth potentiating nephrosis and nephrosis increasing surgical risk must be broken at some point if oral surgery is successful in the sense of extending the life expectancy of the patient.

The rather empiric use of corticosteroids may be justified in any senile surgical patient. Dosage, type, and mode of administration will vary with the patient, and some side effects must be appreciated. However, at this time they may be safely used to tide over a temporary stress situation such as major extractions.

There is an additional purely mechanical function to the preoperative period. It allows or forces the practitioner to do actual extractions on an appointment basis. Good extraction work is tedious and time consuming and nothing can be gained but trouble by jamming these cases too tightly into a hurried schedule.

A few statistics may emphasize this viewpoint. Over 50% of practitioners questioned believed tooth extractions in dogs over 12 years of age were "risky." It must be admitted that the word "risky" is poorly defined. Yet, in a typical practice over 30% of the dental patients fall into this group. On the same questionnaire, few reported the use of digitalization, diet revision, corticosteroids, or hormones to reduce surgical risk. No true mortality statistics are available but it would appear that emphasis should be directed to minor points that influence final results.

Anesthesia

Selection of a suitable anesthesia may be the crux of the entire problem. Fortunately, several products introduced in the last few years are well tolerated by the aged dog. The ultra short acting barbiturates such as pentothal sodium®[2] or surital®[3] sodium are in use by 85% of the practitioners questioned. The author has used surital in nearly a thousand senile patients without a single anesthetic collapse or death.

---

†Presented at the 23rd Annual Meeting of the American Animal Hospital Association, Miami Beach, Fla., May 23-26, 1956.

®[1]Hill Packing Co., Topeka, Kans.

®[2]Abbott Laboratories, North Chicago, Ill.

®[3]Parke Davis Co., Detroit, Mich.

It should be added that some type of oxygen equipment, although not essential, is useful and valuable. A simple tracheal or nasal catheter for administration adds a small extra precaution effort to the margin of surgical safety.

Morphine and demoral®[4] have been used frequently as preanesthetic sedation in more aggressive older dogs. These give the advantage of preventing excessive hypertension in both the patient and the surgeon. The secondary drop in blood pressure and respiratory depression typical sequella in the use of these compounds is a severe limiting factor in aged patients. Recent experience with the ataractic compounds has shown that they have usefulness in this type of problem. More data is necessary before firm conclusions can be drawn. Sparine®[5] is an injectable that has given good results where aggressiveness is due to anxiety and not plain viciousness.

As yet no really suitable anesthetic agent has been offered to the profession for simple scaling during office visits. One of the newer topical agents, dyclone®[6], has shown promise in some cases, but is not always effective where patient anxiety and resistance are met. The ataractic compound plus topical anesthesia may be the proper choice. Since the older patient usually needs more than just scaling, a general anesthetic is usually desirable. Morphine, local blocking and brute strength for dentistry are as archaic as the spay hung on a three wire fence.

Surgical Procedure

No general paper on canine denistry can hope to describe in detail the step by step technics of all extractions. However the fundamental procedures will apply to almost all situations. When possible all sound teeth are scaled first so that hemorrhage does not obscure the field. In general all teeth exhibiting marked alveolar periostitis, excessive gum recession, marked loosening, or draining sinus tracts are doomed and should be extracted. Since the chewing problem and cosmetic factors are relatively unimportant, a radical approach is advisable.

If the tooth is firmly imbedded, scaling for close examination is desirable. When extraction is necessary, the gum is gently separated with tartar scraper or root elevator around the entire circumference. At this point the root elevator, either straight or angular, becomes the prime instrument. Its application depends not on leverage but on the principle of an inclined plane. Ideally a tooth "oozes" out of its socket rather than being lifted out. In the older dog complete ossification between the root proper and the bony socket is common. This increases the tedious nature of the job and emphasizes the need for continued gentle back and forth movements of the elevator.

In the multirooted premolars and molars it is often advisable to cut the tooth before the elevator is applied. Several technics are in common use, however, all precautions should be taken toward gentleness. A root elevator or bone pin may be inserted between the roots at right angles to the root length from the labial gum margin to the lingual. This serves as a guide for cutting. A hack saw blade or jewelers saw will cut the average tooth without excessive spreading. Individual roots may then be carefully loosened with the elevator and fragments extracted separately. If this process is followed without haste, roots are easily extracted intact.

If a sinus tract extending from infected root cavities to the face exists, root cavities may be probed with a bone pin or elevator to insure adequate drainage of the sinus and fistulous tract. Rarely is it necessary or advisable to medicate root sockets unless bleeding is excessive. A cotton packing in the socket usually controls even serious hemorrhage. Injectable clotting agents may be necessary in stubborn cases.

The canine tooth presents a special problem only because of the root length and curvature. Here again the elevator applied gently but persistently around the circumference of the root to its full depth will loosen it sufficiently so that little traction with forceps is necessary. The over-enthusiastic use of extraction forceps on any tooth is dangerous. The elevator should be utilized until it appears that the tooth may be extracted with the fingers.

The incisor teeth of the older patient are usually loose enough to be extracted with the minimum of forcep tension.

In summarizing the survey no adequate rule of thumb could be evolved for the number of extractions desirable at one sitting.

Here the principals of shock, duration of anesthesia, and other purely surgical considerations must be the determining factors.

Summary

The following expressions of opinion reflect the authors basic view on dental surgery.

®[4]Winthrop Laboratories, New York, N. Y.
®[5]Wyeth Laboratories, Philadelphia, Pa.

1. Speed demons and impatient surgeons have no business doing extractions.

2. A tooth has a lingual and labial surface; tartar accumulates on both.

3. Don't crowd your luck — if you wouldn't draw to an inside straight why try to extract all the teeth at one sitting.

4. A forgotten root may prove a real buried treasure — for somebody else's lawyer.

5. It takes a few moments to really loosen roots properly — it takes a month for a fractured jaw to heal.

6. A suppurative tract in the skin seems serious enough to warrant good therapy at any age — why should a suppurative process of a tooth be taken less seriously.

7. Is it possible that there is any correlation between the number of abscessed teeth and the number of old dogs with aggressive dispositions?

REFERENCES

1. AAHA questionnaire on Canine Dentistry—May, 1956.

▾ ▾ ▾

Radiography for Veterinary Practitioner

Dr. M. A. Emmerson, radiologist in the Division of Veterinary Medicine, Iowa State College, Ames, offers pertinent advice in a recent article regarding the use of *x*-rays in veterinary practice. Some of the salient points as interpreted by us are:

1. "*X*-rays are always destructive." We assume an interpretation of this statement is that in the hands of a skilled operator an *x*-ray application for therapeutic purposes results in more good than harm; therefore, the use of this agent.

2. Single large doses are most harmful, though repeated light applications are potentially dangerous.

3. The frequently asserted "stimulating effect" of *x*-radiation is in general fallacious. It is true that following light radiation only a few cells are destroyed and nature quickly repairs the damage, but there are instances where such a large amount of tissue has been destroyed that natural reparative processes are entirely inadequate. Note the destruction, necessitating amputations of fingers and hands, of incautious operators.

4. The same type of equipment is used in fluoroscopy as in radiography though there is a difference in the power of the machines, and in fluoroscopy a screen is used instead of a film. Because of quick results many veterinarians favor the fluoroscope, but the much longer exposure also makes it correspondingly more dangerous to the operator; therefore radiography and leisurely examination of the plate is generally favored.

5. When an assistant (frequently this is the owner of the patient) is asked to help control or "position" the animal the operator, if he wishes to avoid possible court action for damages, must not only offer but must insist that the assistant wear protective dress in the form of lead-rubber gloves and apron. Of course the operator always should protect himself in this manner.

6. Anesthetization or narcotization of a patient previous to radiography is not necessary as there is no pain. As a control measure to quiet the patient it is resorted to, but usually after separate light treatments this is not needed. An ordinary dog board is usually enough.

7. In regard to malignancies Doctor Emmerson states:

(a) "Primary Carcinoma: The results are excellent."

(b) "Sarcomas such as fibrosarcoma, osteogenic sarcoma, neurofibrosarcoma. All are made worse by *x*-ray therapy, and termination is speeded up. However, in the case of round cell sarcomas and spindle cell sarcomas, *x*-ray therapy results in improvement if not in complete destruction of the tumor."

In his presentation Doctor Emerson discusses the *x*-ray treatment of many more conditions not possible to present in an abstract such as this. Taken as a whole he is to be highly commended for an excellent presentation of vital concern to veterinary practitioners. —*R. R. Dykstra, D.V.M.*

▾ ▾ ▾

Surgical principles primarily involved in orthopedics include (1) sound mechanics (opposition and physiological pressure between fragment); (2) avoidance of irritation by excessive handling of traumatized parts, introduction of infection, and interference with electrolytic activity; and (3) maintenance of tissue nutrition by providing blood volume, general body nutrition, and avoidance of disturbing circulation to parts involved.—*Fred Hartshorn, M.D.*

Treatment Of Certain Eye And Ear Diseases Of The Dog: A Clinical Report

R. M. STONE,* D.V.M., Detroit, Michigan

DISEASES of the eye and ear comprise approximately 10% of the conditions treated in canine patients[1]. Fortunately, these conditions are recognized comparatively early by the owner, and affected animals are promptly submitted for examination and treatment. Preserving the functional integrity of these sense organs is an important part of small animal practice, and rapid alleviation is indicated if the organ is to be restored to normal. Three aspects of eye-ear therapy are of paramount importance if this is to be achieved: Antimicrobial effect, anti-inflammatory effect, and anesthetic effect.

Therapeutic Rationale

Antimicrobial Effect. Because a wide variety of bacteria has been incriminated in canine eye-ear disease, a broad-spectrum antibiotic effect is indicated. The most commonly responsible organisms[12], Micrococcus, Streptococcus, *E. coli, A. Aerogenes,* Proteus and Pseudomonas are included in the antimicrobial range of neomycin. This antibiotic exhibits a wider range than bacitracin, penicillin or streptomycin, and has been used with success in a large number of canine eye-ear infections[2, 9]. It is unusually nontoxic and nonirritating for epithelial cells.

Anti-Inflammatory Effect. Inflammation, with its accompanying local edema, hyperemia, cellular infiltration, and pain plays a major role in eye-ear diseases.

The inflammatory reaction may be effectively and rapidly controlled by topical application of anti-inflammatory agents[8, 10]. Hydrocortisone is the most powerful of these, exerting a direct and potent effect. In the eye, hydrocortisone relieves inflammation, hence pain and photophobia, particularly in lesions of the cornea. Through decreased vascularization and reduced scar formation, clearer corneas may result. In the ear, inflammation, pruritus, and pain are rapidly relieved[10]. Relief of pain with hydrocortisone is believed due to the curtailing action of the steroid on the inflammatory process, rather than due to a specific analgesic effect.

Anesthetic Effect. Many investigators have demonstrated that local anesthesia plays a significant role in the promotion of healing[11]. If the pain reflex is abolished by use of a local anesthetic, amelioration of the reflex vasodilatation and resultant edema, tenderness, and muscular spasm is the result.

Tetracaine® hydrochloride (amethacaine hydrochloride) is a topical anesthetic more potent than either procaine or cocaine in comparable concentrations[13], and has greater ability than procaine to penetrate mucous membranes[14]. The duration of anesthesia exceeds that produced by either butacaine or phenacaine[15]. It has no effect on pupillary dilatation or accommodation.

Case Reports

A number of representative cases are summarized in table 1. Each eye or ear case was subjected to a certain routine of therapy before application of a preparation containing neomycin, hydrocortisone, and tetracaine.

Eye Cases. One of the most common ophthalmic conditions treated in the writer's practice is chronic follicular conjunctivitis, characterized by constant ocular discharge. The following course of therapy has proved effective:

1. Topical anesthesia, administered in drop form every 15 minutes for one hour. Intractable or unusually active patients received meperidine hydrochloride 10 mg./kg. body weight one hour prior to further handling.
2. Cauterization of both sides of the membrana nicitans, using a crystal of copper sulfate.
3. Irrigation of the eye with an eyewash.
4. Application of an ointment containing neomycin sulfate, 0.5%, hydrocortisone acetate, 0.5%, and tetracaine hydrochloride, 0.5%*.
5. Dispensing the ointment for home use.

In ulcerative keratitis, regardless of etiology,

*Canterbury Clinic, Detroit, Mich.
*Supplied as neo-cortef® with tetracaine® — The Upjohn Company, Kalamazoo, Mich.

the following additional supportive treatment was used:

6. Vitamin A, 100,000 I.V. intramuscularly initially, followed by 25,000 I.V. orally daily.

7. Topical atropine 1%, daily.

8. Vitamin B complex intramuscularly and vitamin E, 50 I.V. orally, daily.

9. Restriction of exposure to light.

Ear Cases. Suppurative otitis externa is by far the most common ear disease of the dog in this practice. When operation is not economically possible, the following course is used:

1. General anesthesia, administered as a short-acting barbiturate.

2. Clipping the hair around the external meatus and plucking hair in the canal with hemostats.

3. Cleansing with a germicidal soap.

4. Rinsing the ear with warm tap water and an ear syringe.

5. Aspirating residual water with a Penburthy aspirator, followed by final drying with cotton balls.

6. Reapplication of neo-cortef with tetracaine ointment, accompanied by gentle massage.

7. Glueing and taping the ears over the head.

In acute otitis without purulent discharge, only germicidal soap and the ointment are used.

REFERENCES

1. ....., Relative Incidence of Diseases Among Pet Animals. *Jour. Am. Vet. Med. Assn.*, 108:371 (June), 1946.

2. Jones, W. G., A Preliminary Report of the Flora in Health and Disease of the External Ear and Conjunctival Sac of the Dog. *Jour. Am. Vet. Med. Assn.*, 127:442 (Nov.), 1955.

3. Davidson, J. L., Neomycin Sulfate in Veterinary Dermatology and Ophthalmology. *Vet. Med.*, 47:239 (June), 1952.

4. Bicek, E. K., Neomycin, an Adjunct in Veterinary Surgery. *Jour. Am. Vet. Med. Assn.*, 124:105 (Feb.), 1954.

5. Braeutigam, H. M., Neomycin in Veterinary Practice. *N. Am. Vet.*, 35:26 (Jan.), 1954.

6. Haas, K. B., Use of Neomycin and Erythromycin in Veterinary Practice. *Vet. Med.*, 50:460 (Oct.), 1955.

7. Kitchen, H. B., and Waksman, S. A., Streptomycin and Neomycin in Veterinary Medicine. *Jour. Am. Vet. Med. Assn.*, 127:260 (Sept.), 1955.

8. Davidson, J. L., Preliminary Report on the Use of Hydrocortisone and Hydrocortisone with Neomycin in Dogs and Cats. *Vet. Med.*, 49:286 (July), 1954.

9. Schultz, H. L., Clinical Use of Neomycin-Hydrocortisone Ointment in Dogs and Cats. *Vet. Med.*, 50:32 (Jan.), 1955.

10. Hopkins, D. M., and Lerch, R. J., Local Hydrocortisone Therapy in Canine Otitis Externa. *Vet. Med.*, 50:85 (Feb.), 1955.

11. Davidson, J. L., Use of Newer Corticosteroids in Animals. *Vet. Med.*, 51:222 (May), 1956.

12. Combes, F. C., *et al.*, Tropical Anesthesia. Effect on Tissue Regeneration. *Am. Jour. Surg.*, 74:45 (July), 1947.

13. Leriche, R., The Surgery of Pain. William & Wilkins Co., Baltimore, 1939.

14. ....., New and Nonofficial Remedies. J. B. Lippincott Co., Philadelphia, 1955, p. 52.

15. Osol, A., Farrar, G. E., *et al.*, The Dispensatory of the United States of America, ed. 25. J. B. Lippincott Co., Philadelphia, 1955, p. 1399.

16. Smelsar, G. K., and Ozanica, V., Effect of Local Anesthetics on Cell Division and Migration Following Thermal Burns of the Cornea. *Arch Ophthalmol.*, 34:271 (Oct.), 1945.

17. Magrane, H. J., Basic Treatments for Common Ophthalmic Lesions. *Vet. Med.*, 50:267 (June), 1955.

Results of Neo-Cortef® with Tetracaine Ointment Therapy in Canine Eye and Ear Conditions

Breed	Age (Yr.)	Sex	Diagnosis	Administration	Other Therapy	Results
Cocker Spaniel	6½	M	Corneal opacity, chronic conjunctivitis	t.i.d. 1 wk.	—	Excellent, opacity gone in 3 days
Beagle	1	M	Perforated bilateral corneal ulcers secondary to distemper	t.i.d. 2 wks.	Systemic antibiotics, fluids, vitamins corticoids	Excellent
Basset	1	M	Traumatic keratitis	t.i.d. 1 wk.	Removed foreign body	Uneventful recovery
Boxer	2	M	Subconjunctival hemorrhage	t.i.d. 1 wk.	—	Uneventful recovery
Min. Fr. Poodle	2	M	Chronic follicular conjunctivitis	t.i.d. 1 wk.	Copper sulfate	Excellent
Min. Fr. Poodle	1½	M	Chronic follicular conjunctivitis	t.i.d. 1 wk.	Copper sulfate	Excellent
Cocker Spaniel	3½	M	Subconjunctival hemorrhage	t.i.d. 1 wk.	—	Excellent
Cocker Spaniel	3	M	Chronic follicular conjunctivitis	t.i.d. 1 wk.	Copper sulfate	Excellent
Scot. Terrier	7	F	Acute otitis externa	2 applications 3 days apart	Detergent	Excellent
Min. Fr. Poodle	4	F	Acute otitis externa	u.i.d. 1 wk.	Detergent & tape over head	Excellent

Training of the Veterinarian's Assistants

Abstract of the Report of the Committee on Employee Training of the American Animal Hospital Association, Miami Beach, Florida, 1956. Committee members: Dr. David C. McNary, Dr. Lendall K. Firth, Dr. C. Edwin Hofmann.

Veterinary practitioners have been faced for years with the problem of interesting responsible persons in associating themselves with professional establishments. In respect to comparative difficulties it appears to be a reasonable conclusion that because of the nature of duties few suitable applicants are available to fill positions in veterinary hospitals. Receptionists, technicians, grooms, handlers, orderlies, and general service personnel must apply themselves diligently to succeed. Duties impose some stresses on employees and assistants that are not inherent in industrial positions requiring similar utilization of skills and offering relative compensation.

The special services of a modern veterinary hospital are specific. No group of any significant number has had applicable training of any sort. A veterinarian is required not only to select with some special care the assistants he needs but in most cases must train these people in the services to be performed. The methods used have not always been carefully designed and too often, because of pressure of duties and for other reasons, new employees are given insufficient instruction or none at all. In these cases, specific in-service direction is a trying method both on veterinarian and assistant. When the size of the staff is large, training technics employed by industry generally can be used. This is not always possible in practices serviced by one or two veterinarians employing from two to five assistants. In the latter case both employer and employee suffer disappointments resulting from a short tenure of employment.

In the hope that a study of problems at once apparent would be rewarding, a Committee was set up by the A.A.H.A. to determine whether or not there is need for some prescribed training of lay personnel prior to their employment as full time assistants to veterinarians, and to test the advisability of developing methods for training employees already on the job to enhance their efficiency and effectiveness.

To initiate their work a questionnaire designed to gain a cross section opinion was mailed to members. In addition to statistical material, answers revealed that practitioners were vitally interested and were experiencing tribulations commonly voiced whenever practitioners get together. An effort was made to tabulate results.

Of 175 questionnaires returned for Committee study it was computed that the average small animal hospital is staffed by five full times employees. Four others perform part time service and an additional three are used seasonally. The range extends from a veterinarian and one assistant to those establishments employing 20 or more men and women on a full time basis. Slightly over 80% (141) of those questioned employed a receptionist. Duties of individuals in this group included bookkeeping tasks and stenography in addition to meeting clients and handling telephone calls. Approximately 25% assisted the doctor in treatment of patients or performing simple laboratory procedures. General inference was gained that personnel were needed for more clinical laboratory work and that only because of limitations of training were so few given laboratory assignments. Practically all clinicians replied that those persons assigned jobs of cage sanitation and janitorial work were used as assistants in the treatment room. The kennelman was used as a man of all duties, a situation that prompted the Committee to suggest that this was in many instances undesirable from the standpoint of best interest of the practitioner. Specially trained persons for handling and nursing appeared most practical and necessary for best results and service to clients.

Source of Assistants

In isolated instances and in specific communities veterinarians appear to have source of employees having both training and experience. In most no such source is available. Employees must be recruited either from distant cities or from the general labor force. The Committee reported that the consensus pointed out the urgent need for some sort of organized training for lay assistants, assistant laboratory technicians, receptionists, grooms, and nurses, and that fewer express the same urgency for training kennelmen. No doubt difference in duties assigned the latter made interpretation of opinions difficult. Duties of kennelmen in some instances are confined only to sanitary maintenance whereas others are looked upon as nurses and grooms. Perhaps the definition of "kennelmen" should be

clarified. Training would naturally be in proportion to the extent of his duties that are peculiar to the handling of animals. Perhaps less difficulties ordinarily attend replacement of kennelmen or those having some knowledge of handling and feeding dogs. Few assistants, other than professional, now employed ever had experience in a similar establishment. This means that practically all had been trained by their present employers.

One question inquired for reasons assistants gave for quitting their jobs and why others were discharged. Transfer to industrial position at increased pay was mentioned frequently. Others included call to armed services, domestic difficulties, and health. Reasons for discharge were incompetence and intoxication. From this it may be concluded that either employers were not screening applicants for positions carefully enough or else those attracted to the offer of jobs in veterinary hospital were either using the position as an interim occupation or else were among the group of itinerant labor force that changes positions frequently.

The average assistant (duties not defined) stays with his employer about two or three years. Other classifications of employees stay for periods varying from a few months to what is referred to as permanent. Kennelmen assistants are steadiest. These people apparently enjoy their work and like to handle dogs. Some reported kennel assistants who have been continually employed for periods up to 20 years.

Some members who were consulted privately regarding the matter expressed the opinion that directors of animal hospitals generally would not accept the pre-employment concepts for lay assistants. They felt that by such training useful personnel likely would change positions repeatedly from hospital to hospital whenever they were in position to auction their service, or to encourage employers to bid against one another for trained assistants. The questionnaire, it was reported, brought out that the exact opposite accurately portrayed the situation. Most veterinarians expressed concern in reference to professional associates changing employment in local hospitals since most have individual followings. Only a few express concern over whether or not the receptionist, technician, et cetera changed positions between local hospitals. The desirability of pre-employment training and careful programming of in-service training was expressed by 80% of those returning the questionnaire.

Training Suggestions

Two methods of implementation were suggested: (1) Courses offered in presently established veterinary schools, and (2) private schools set up for the purpose. The opinion was unanimous that receptionists especially need thorough training and some indoctrination because of the vital link they serve in client-veterinarian relationship. The working hospital director is dependent upon successful management of the front office. Thoughtlessness or careless attitude or action may have a profound effect not only on the practice but upon the public impression of the profession. Some considerable effort has been expended in providing wives and girl friends of veterinary students instruction in such service. While this is to be encouraged it does not fill requirements since most of those who answered the direct question indicated that their wives did not participate in the operation of the hospital or practice. Some members also emphasized that they did not want wife participation or assistance. In total only about 15% indicated that members of their families assisted in the practice.

What Can be Done?

Suggestions as to possible methods that might be proposed to fill the need for trained personnel were not condensed in the committee report. Though a great many recognized the advantages to be derived from some such effort multiple problems presented themselves, not the least of which was the limitations of employers to compensate adequately those interested enough to prepare themselves for specific service. It was suggested that a group effort be made to seek the response of officials at veterinary schools in providing an experimental training program. Perhaps a short course of two to four weeks could be set up for study and experiment.

Persons already employed in Animal Hospitals might be encouraged to attend such courses as conferees or for instructions to improve their efficiency and effectiveness. Such a course or a different and more exhaustive one (perhaps for one year) might be fitted into school training schedules. Interested high school graduates would be invited to attend, as well as those who for one reason or another found they could not qualify or could not prepare themselves for the professional curriculum.

Recognized were intricate problems from many aspects. Further study and consideration was recommended.

Flood, Hurricane and Other Casualty Losses are Tax Deductible

HAROLD J. ASHE

Every year many veterinarians sustain casualty losses of one kind or another. These should be reflected in income tax returns to reduce the tax bill and, sometimes, bring a tax refund. An income tax refund can not be had until after the close of the tax year. However, veterinarians sustaining such losses should not wait until income tax filing time to determine the exact nature and extent of their losses for income tax purposes.

These losses may arise from accidents, fire, storm, hurricane, earthquake, flood, and similar disasters, or theft. A dramatic example of casualty losses are those which arose from previous floods in the East. Other major disasters cause widespread damage and destruction. However, a loss also may occur as a result of an isolated casualty striking a veterinarian's property, and be no less costly.

Delay in establishing proof of loss sustained may be fatal. Trusting largely to memory or inadequate records long after the event may result in either: (a) Under-calculating the loss, with a reduction in the possible tax saving otherwise available; or (b) having the amount of the loss challenged by the Internal Revenue Service, and with insufficient proof to support the amount of the loss claimed in the income tax return.

It is unwise to assume that tax counsel can establish the needed proof of loss at time of making the annual income tax return. While calculating the tax deductible loss may best be left to tax counsel, supplying him with necessary records and evidence of loss is the responsibility of the veterinarian. The sooner this record is built the more accurate and complete it will be and the less chance it can be challenged successfully.

The Internal Revenue Service does not require any one arbitrary kind of proof of loss. However, the proof should be as complete as possible, subject only to loss of vital records in the casualty. This proof may range from comparative before-and-after photos of the property to expert appraisal of the loss, based on the value before the casualty and the value after the event, taking into account salvage value, if any.

The cost of making repairs will be helpful in supporting the loss claimed. However, repairs should not go beyond the point necessary to restore a damaged property to its pre-casualty condition. A casualty loss should not be misconstrued as an invitation to make improvements which go beyond restoration, and with the idea such improvements can be claimed as part of the loss — and with a resulting income tax reduction.

What is Deductible?

Casualty losses may include damage to, or destruction of, a veterinarian's office structure or animal hospital, professional equipment, fixtures, furnishings, and supplies as well as other items of real value in the profession. In this connection, a veterinarian should not overlook assets, if any, outside the structure, such as shrubs and other plantings, surfaced parking areas, fences, signs, and similar items.

Personal Property

Non-business casualty losses are also deductible, although by a different formula. These include damage or destruction of a residence and its contents, including personal effects. In determining losses, sentimental values are not permissible, only intrinsic values being deductible.

Insurance Recovery

All losses, business or non-business, must be adjusted to reflect insurance reimbursement, if any. If the loss is reimbursed completely there is no loss and no deduction, tax-wise. If the insurance exceeds the loss there is a taxable gain, unless the destroyed property is replaced in conformity with rules spelled out in the regulations.

Quick Tax Relief

An income tax refund, as already pointed out, is not available until after year-end. However, a veterinarian may get some relief by amending his declaration of estimated income tax on or before January 15, 1956. If his loss is great enough to wipe out his fourth quarterly installment on his estimated tax, he should make an amended declaration for an amount not exceeding the total of the first three installments. If he expects to have no income tax obligations for the year, because of the casualty loss, he should so state on the amended estimate, indicating the amount already paid.

Carry Back-Carry Forward

If the casualty loss exceeds the year's income, the loss can be carried back two years

and, if necessary, be carried forward five subsequent years. Thus, the excess loss above 1955 income can be carried back and be applied against 1953 income, resulting in a partial or complete refund of that year's income tax, depending upon whether the loss reduces, equals or exceeds 1953 income. If an excess loss still remains, it is next applied to 1954 income with, again, a refund on that year's tax. Finally, if after the carry back of the loss there is still an excess, this can be applied to future earnings, starting with 1956 and extending, if necessary, through 1960. Thus, a veterinarian sustaining a heavy casualty loss may get tax refunds as well as future tax relief as a partial offset to his losses.

Act Quickly after Year-end

The sooner after year-end that a veterinarian files his 1955 income tax return the more quickly may he get an income tax refund, giving him a cash assist in bearing his loss. If elimination of the fourth quarterly tax installment is not sufficient to adjust the tax obligation (see quick tax relief paragraph), the income tax return should be filed as early in January as possible. This, incidentally, will eliminate the necessity for filing an amended declaration of estimated tax. If there is a carry-back loss, an amended income tax return should be filed for 1953 and, if need be, for 1954. Early filing of amended returns may speed up tax refunds.

Employ Tax Counsel

A good many veterinarians ordinarily make their income tax returns without employing tax counsel. If a substantial casualty loss has been sustained, it can not be urged too strongly that expert help be employed. This will insure the loss being reflected correctly in the income tax return and reduce the likelihood of refund delay or challenge of the loss. In January, tax counselors are less pressed for time and can give a client's casualty loss problem more consideration than if this matter is delayed until around tax filing deadline. Before year-end, counsel well may be consulted as to precisely what information and in what form it will be required to resolve the problem.

Loss Formulas

It may not be amiss to give a hint as to the complexity of reflecting properly a casualty loss in an income tax return. Two distinct formulas are required, one for business losses and the other for non-business losses.

For non-business property the loss is the difference between the fair market value immediately before the casualty and the fair market value immediately thereafter, but limited to the *cost* of the damaged property.

For business property several related factors enter into a determination of the deductible loss allowable for tax purposes. The loss is first determined by the difference in the fair market value before and after the casualty. This establishes the percentage of the loss, based on the fair market value before the casualty. This percentage then must be applied to the adjusted basis of the property to establish the deductible loss. The adjusted basis is the cost less annual depreciation.

The foregoing over-simplified explanation of the respective formulas suggests the wisdom of employing expert counsel if the loss — and the possible tax saving — is substantial.

▼ ▼ ▼

Veterinarians and Fur Breeders Design Disaster Service Program

The directors of the Wisconsin Fur Breeders Association met with veterinarians from throughout the state in Wisconsin Rapids recently to formulate a state-wide veterinarian service for handling of the many problems arising from disease and dietary troubles on the mink ranches of Wisconsin. This program of cooperation of producer and veterinarian is reported to be working out to the satisfaction of all concerned.

This group will be known as the Wisconsin Fur Breeders Veterinary Service, according to Roger Nelson, president, and will function as a part of the Disaster Service Program sponsored by the Wisconsin Fur Breeders Association.

Dr. C. E. Harries of Medford, Wis. was elected chairman of the Veterinary Service and Dr. A. M. McDermid of Middleton was elected vice-chairman. The secretary will be Robert Dunkel, who is also secretary of the parent association. Dr. G. R. Hartsough of New Holstein, was appointed as the representative to the Disaster Service Program Advisory Board. Dr. H. Kopit, Berlin; Dr. D. O. Early, Crivitz; and Dr. John A. Wilson, Burlington were present representing their respective districts.

The state has been divided into nine districts with an official veterinarian assigned to each district. Ranchers living within the boundaries of each district will contact the association veterinarian when in need of help. The state asso-

ciation through its Disaster Service program will maintain supplies of drugs, vaccines, and antitoxins in each district so that when disaster strikes a mink ranch everything will be quickly available. In cases of botulism speed of treatment can mean the difference between recovery or being wiped out of business.

The Wisconsin Fur Breeders Veterinary Service will record all calls with this data being used as a supplement to the research being carried on by the Mink Farmers Research Foundation of which Dr. Hartsough is a Director.

▾ ▾ ▾

The Denver System

The Denver system of management of dogs has earned the respect of disease control officials and dog owners. The plan grew out of discussions among various groups to which the local veterinary association contributed significantly.

Denver formerly had no vaccination laws. A licensing arrangement existed, enforcement of which was in the hands of the police department. Fees collected were credited to the Police Pension Fund. In July 1949, a limited outbreak occurred outside the jurisdiction of municipal authorities. It nevertheless spotlighted the need for control measures which were initiated under the recommendation of Dr. Martin D. Baum, Colorado Public Health Veterinarian and Dr. Robert Anderson, Veterinarian of the Denver Department of Health.

The major changes first involved centralizing dog control in the Public Health Department. Thereafter the following steps were taken: (1) Substitution of licensing for antirabies vaccination. This required the dog owner to take his pet to a veterinary practitioner of his own choice for vaccination. The nominal fee for vaccination was paid the veterinarian who issued a tag supplied by the city for the calendar year. Vaccine selection was left up to the veterinarian; annual treatment was made compulsory. The next step (2) called for the transfer of the facilities of the local dog pound from the Police Department to the Department of Public Health. These were remodeled and equipped for practical use and aesthetic reasons. The public now may be proud of its animal shelter. The last step (3) changed the designation of those employed for enforcement of the vaccination. The designation "Rabies Control Officers" immediately gained the respect of the community and reversed hostility to the entire program as administered earlier.

Results have surprised even those who outlined the plan. Cooperation of dog owners has been consistently good. Denver is assured, through thoughtful and carefully planned preventive action, of virtual freedom from rabies among the dog population of that city. The plan is worthy of study by other municipalities.

▾ ▾ ▾

Fats and Health

Evidence appears to be accumulating, according to *What's New* (Summer 1956, p. 20), that "strongly implicates the high fat content of the American diet as a causative factor in atherosclerosis." Some writers and physicians have accepted the theory of direct relationship of degenerative heart disease with the intake of animal fats, a theory which has not been proved. The growing discrimination against animal fats developing partially because of wide acceptance of this theory, does have unfavorable influence on the livestock industry and veterinary medicine.

Admittedly, the science of nutrition, particularly as it applies to human needs, is relatively young and certainly immature. So far it has been concerned largely with problems of malnutrition, the main consideration of a large segment of the world's population. Correlations have been drawn from group studies, *i.e.*, South African, semistarved European, and others have as a group both low serum cholesterol levels and incidence of degenerative heart disease compared with the situation in America where relatively high cholesterol levels and incidence of cardiovascular disease exists. To accept the theory proposed by some on the basis of studies so far concluded is to deny many exogenous factors to which various races are exposed and their eating habits. It has been agreed that the plasma cholesterol level is not a direct reflection of the true relationship between cholesterol metabolism and atherogenesis. Nor are obesity and cholesterol levels correlated.

Atherosclerosis, a simple form of artheriosclerosis, is not confined to aged individuals. It is not uncommon among young adults and is claimed to begin in childhood. Medical science is disturbed because failure to reduce incidence and mortality resulting from atherosclerosis has deterred somewhat life expectancy increases effected by control of other diseases.

Research in this field is challenging and is being vigorously pursued. If animal fats are irrevocably proved to be a primary contributing factor toward the relatively high death rate of Americans, present eating habits may undergo drastic changes that could likely have serious influence on the livestock industry.

▼ ▼ ▼

Harry Miller, director of the Gaines Dog Research Center, New York City, is shown with plaque presented him "in recognition of long years of conscientious service in the interest of all dogs" at testimonial dinner by the National Dog Welfare Guild, of which he is honorary vice-president. Nearly 200 guests were present at the Park Lane Hotel affair, and congratulatory wires came from all over the country for Mr. Miller, who is also known as "dog's best friend."

▼ ▼ ▼

New Facts Relating to Rabies

We consider it worthy of repeating some items gleaned from Animal Disease Trends of July 1956, issued by the Ohio Division of Animal Industry and the Ohio Office of Animal Disease Eradication, USDA. From the foregoing source it is indicated: (1) That in 30% of Negri positive dogs there is no virus in the saliva; (2) only 20 to 25% of untreated human beings, with known exposure, contract the disease, though in those that contract it, results are fatal; (3) fuming nitric acid is not the best agent to apply to recently inflicted animal bites — 1% zephiran® chloride, or 20% tincture of green soap is "much better". "Hyperimmune serum can also be used locally." The busy practitioner is frequently asked questions requiring answers such as given in the preceding material.—*R. R. Dykstra, D.V.M.*

▼ ▼ ▼

®Winthrop Laboratories, New York, N.Y.

Advertising Policy of *Dog World*

The publishers of *Dog World*, national publication for the dog fancy, advises its readers in an editorial (August 1956—p. 12) of the conviction of their editorial staff that the best interest of breeders and owners could be served by discouraging self-doctoring of pets particularly with modern drugs and biological products having potency and specificity. This policy is wise and its premise is basic and sound.

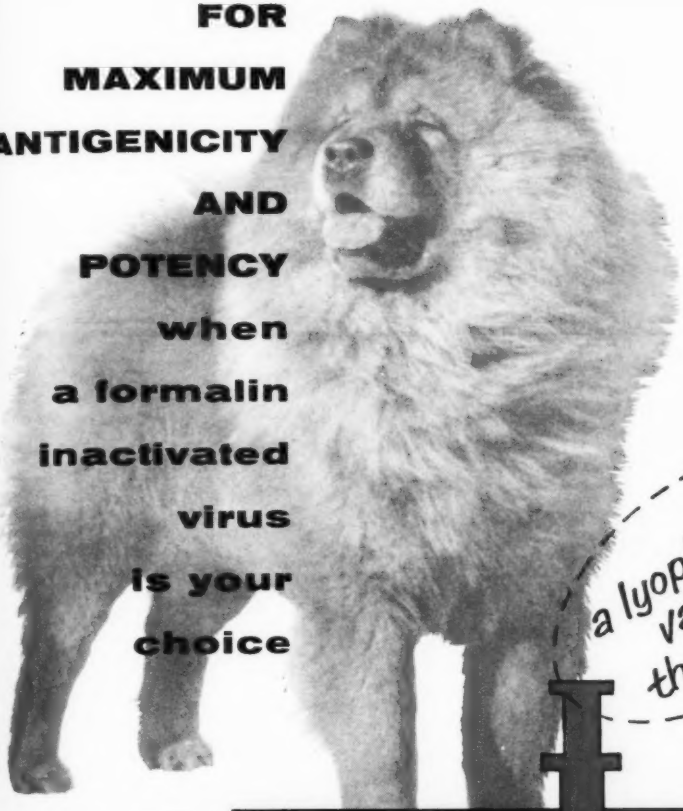
It is certainly true that Congress has set the policy that an owner has the inalienable human right to attempt diagnosis and treatment of animals which are his own property. These have a statutory right to demand and receive safe and efficacious drugs. This, however, does not make it reasonable for every kennelman to be his own veterinarian. It may be even dangerous to the owner, his associates, or the public.

Regardless of the standard by which chemotherapeutic agents and biological products are produced, it is ridiculous to assume that there is, as stated by one breeder, "no danger, that an injection is merely a matter of puncturing the skin with a needle and injecting its contents." Many drugs have margins of safety dependent measurably on their proper use. Under some circumstances related to administration potent drugs, live viral vaccine, et cetera are toxic within the broad meaning of the term. Added is the thought that many intrinsic and extrinsic medical factors often influence efficacy of medicinal agents. Charges of carelessness are aimed occasionally at practitioners. It of course is pure tomfoolery to say that professionals do not err. They do. The point is that the best qualified service for the maintenance of health and treatment of disease processes should be sought in all problems involving hazards that might not be appreciated by those having no formal training. In this is consideration not only for the pet or pets vaccinated or otherwise treated but of other animals, as well as the human health aspects related to use of the products of high-level scientific research. These deserve, generally, the most expert care available for administration. Promiscuous use of medicinal products produced under rigid scientific care could conceivably influence unfavorably their efficacy and subsequently their acceptance.

▼ ▼ ▼

Science is an arrangement of what at the moment appear to be the facts.

FOR MAXIMUM ANTIGENICITY AND POTENCY when a formalin inactivated virus is your choice



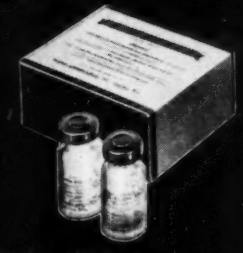
a lyophilized vaccine is the answer

FOR YOUR USE!

"Life with Rover"—an entertaining and informative 8-page booklet on the ancestry, diet and health-care of dogs for free distribution to your dog-owner clients. Available from your local distributor on request with your Fromm biological orders.

Sold only to Qualified Graduate Veterinarians.

HEPOID infectious canine hepatitis vaccine



When a durable immunity against Infectious Canine Hepatitis is desired.

or

BIOID canine distemper and infectious canine hepatitis vaccine

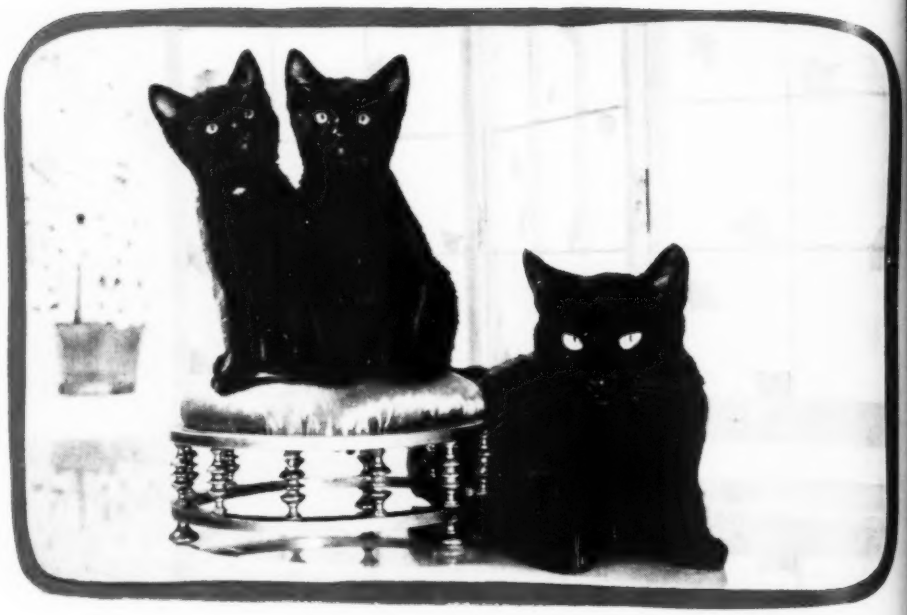
When a durable immunity against EITHER or BOTH Canine Distemper and Infectious Hepatitis is desired.

Supplied in Single Vial, or 10 Single Vial Packages.

CONTACT YOUR LOCAL DISTRIBUTOR

Fromm Laboratories Inc.

GRAFTON, WISCONSIN, U. S. A.



"Living proof of good nutrition"

The effects of diet upon a cat are so readily apparent—even to the non-professional eye—that the claims of a cat food manufacturer must stand or fall upon *visible* results.

The nutritional excellence of Puss 'n Boots has been scientifically confirmed for years, through continuous observation in our own cat colony. But it is very satisfying to have them re-confirmed by laymen, in the thousands of letters we receive. One cat owner, describing her pet as "beautiful, healthy and lovable," added the words: "living proof of good nutrition."

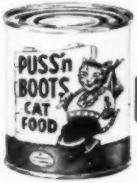
Puss 'n Boots IS Good Nutrition

The Puss 'n Boots formula is based on *whole* fish (not by-products), including the fillets with their quantitative and qualitative protein superiority. The liver and glands are retained for vitamins and minerals; the bone structure (made soft and crumbly) for calcium. All the life-giving elements of the whole fish are retained— in *nature's own ideal balance*.

Selected cereals are added to the finely ground whole fish for all-round nutrition. And there is *extra* Vitamin B_1 (thiamine) added to every can of Puss 'n Boots as a margin of safety.

Use and Recommend with Confidence

You can recommend Puss 'n Boots to cat-owning clients with assurance that its good nutritional effects will be seen by them — quickly. Puss 'n Boots is sold at food stores and pet shops everywhere, in two handy sizes.



PUSS'n BOOTS
is Good Nutrition

America's largest selling cat food... adds the plus in health, beauty, energy

COAST FISHERIES DIVISION OF THE QUAKER OATS COMPANY, CHICAGO 54, ILL.

n"

ll the
re re-

round
ere is
every
afety.

own-
nutri-
ickly.
d pet

TS

DICINE

Anthrax In Livestock During 1955

C. D. STEIN,* V.M.D., and G. B. VAN NESS, D.V.M.,
Washington, D.C.

IN a previous report[1] the authors presented statistical data on the incidence of anthrax in livestock from 1945 to 1954 inclusive. It was pointed out that during this ten-year period 3,447 anthrax outbreaks had been reported from 39 states with estimated losses of 17,604 head of livestock. Outbreaks in new areas were reported from 34 states involving 475 counties.

The data presented in this report are based principally on the information contained in the monthly anthrax reports submitted to the Agricultural Research Service by livestock sanitary officials of different states and territories.

Table 1 shows the states reporting outbreaks in livestock in 1955 with data on the incidence of the disease and suspected source of infection. Table 2 shows the incidence of anthrax for each quarter of 1955 and the number of outbreaks confirmed by laboratory examination. Table 3 gives comparable data for the 11-year period of 1945 to 1955.

The data compiled from the 1955 survey reveals that during the year, 122 anthrax outbreaks in livestock were reported from 20 states involving 61 counties, with an estimated loss of 264 head of livestock. It is apparent from table 3 that 1955 was decidedly not an anthrax year as the total loss of livestock from this disease was considerably less than in any years from 1945 through 1955. No major widespread outbreaks were reported during the year.

Most of the outbreaks reported were sporadic, resulting in minor losses and occurring on farms in known contaminated areas. The greatest losses were reported from contaminated areas in California, Louisiana, South Dakota, and Texas. Virtually all the outbreaks reported occurred in cattle. Sheep losses were confined to California, with the loss of 21 animals in two outbreaks.

*Doctor Stein is now retired and is residing in Washington, D. C.

TABLE 1. States Reporting Anthrax Outbreaks in Livestock in 1955 and Data on Incidence*

State	Losses from Anthrax: No. outbreaks	Cattle	Swine	Misc.	Total	Suspected source of infection: Soil	Feed	Unknown	Outbreaks confirmed by lab. exam.
Arkansas	2	3	—	2 mules	5	2	0	0	2
California	10	21	—	21 sheep	42	10	0	0	10
Colorado	1	6	—	—	6	0	0	1	1
Delaware	1	1	—	—	1	1	0	0	0
Illinois	1	3	—	—	3	1	0	0	1
Iowa	1	1	—	—	1	0	0	1	1
Louisiana	39	85	8	8 horses 4 mules	105	39	0	0	12
Minnesota	1	3	—	—	3	1	0	0	1
Mississippi	3	2	1	—	3	3	0	0	3
Missouri	3	2	2	—	4	3	0	0	0
Nebraska	7	10	—	1 horse	11	0	0	7	7
Nevada	1	1	—	—	1	1	0	0	1
New Jersey	7	9	—	(100 mink)	9**	6	0	1	7
New York	6	6	—	—	6	2	***	3	3
North Dakota	3	9	—	—	9	3	0	0	3
Oklahoma	1	1	—	—	1	1	0	0	1
Oregon	1	1	—	—	1	0	0	1	0
South Dakota	27	27	—	—	27	27	0	0	18
Texas	6	20	—	—	20	0	0	6	6
Wyoming	1	6	—	—	6	0	0	1	1
Totals	122	127	11	21 sheep 9 horses 6 mules	264	100	***	21	78

*Data based on corrected monthly reports. **Does not include 100 mink. ***Also one case of vaccine anthrax.

TABLE 2. Monthly Incidence of Anthrax in Livestock for 1955

Month	No. states reporting outbreaks	No. outbreaks reported	Livestock losses*	No. counties involved
January	1	1	1	1
February	1	3	7	2
March	5	7	10	6
April	5	8	17***	8
May	4	6	6	5
June	5	8	25	7
July	9	22	53	16
August	9	32	52	18
September	8	19	46	14
October	5	10	14	10
November	3	4	19	4
December	2	2	14	2
Totals	**	122	264	—

*Includes — cattle, swine, horses, mules, and sheep. **A total of 20 different States reported outbreaks. ***Does not include 100 mink.

The greatest number of outbreaks and largest loss of livestock occurred during the third quarter of 1955, tables 1 and 2.

Delaware, where anthrax was formerly prevalent, reported the first outbreak in ten years. An outbreak also occurred on a farm in New York, where anthrax was reported 25 years ago. A similar interval was reported for the Louisiana-Mississippi Delta outbreak of 1954. In these, the soil was reported as the probable source of infection, a reminder that under some conditions anthrax may persist in the soil for years.

The suspected sources of infection of the 1955 outbreaks were as follows: Contaminated soil — 100 outbreaks; postvaccination anthrax, 1 outbreak; unknown, 21 outbreaks. Outbreaks in new areas were reported from one county each in Delaware, Louisiana, New York, North Dakota, Oklahoma, South Dakota, Wyoming, and from two counties each in Nebraska and Mississippi.

The spread of anthrax into new areas is of considerable importance, since when favorable conditions are found, subsequent losses from the disease may be expected. Van Ness and Stein[1] reported certain soils in the United States might serve to perpetuate contamination. In general, these were neutral or alkaline with adequate reserves of calcium. When the 1955 outbreaks are considered the results are generally in support of the idea that new foci of infection are developing in areas with these soils. Of the 61 counties reporting losses, 45 contained soils considered capable of supporting *Bacillus anthracis* and ten have alluvial deposits associated with suitable soils. The remaining six counties not associated with soil groups are known to contain diverse small soil groups not reportable on the general soil map, including some alluvium influenced by salt water and glaciated soils. The counties reporting anthrax for the first time were distributed as follows: Six had suitable soils and two contain alluvium closely associated with suitable soils. Of the remaining two, one has extensive salt water marsh land, and the other was considered an imported infection on the premise.

A loss of 100 mink of a total of 900 occurred in Cumberland County, New Jersey in April, from eating meat from a cow which had died from anthrax. The source of infection was traced to a farm in Salem County, when a second case occurred in July. The outbreak in mink and the case in July were confirmed by laboratory examination.

The United States Public Health Service[1] reported 27 cases of anthrax in man during 1955. This provisional figure is subject to correction.

TABLE 3. Summarized Data on the Yearly Incidence of Anthrax in Livestock from 1945 to 1955, Inclusive

Year	No. states reporting	No. counties involved	No. outbreaks	Livestock losses*
1945	14	52	97	583
1946	18	82	163	4,019**
1947	19	65	124	880
1948	14	63	120	1,654**
1949	16	57	93	773
1950	12	55	61	595
1951	25	113	483	2,753
1952	32	432	1,644***	3,451
1953	26	121	233	597
1954	23	74	429	2,299**
1955	20	61	122	264

* In some states losses were estimated. **Heavy losses were reported during severe epizootics of the disease in Louisiana. ***Greatest number of outbreaks in swine herds in the Midwest and postvaccination outbreaks in cattle in Kansas and New Jersey.

All but three of the human cases reported were of industrial origin. One of three cases of agricultural origin occurred in a veterinarian in Louisiana who contracted the disease while performing an autopsy examination on a cow that had died. The other two cases occurred in employees of a rendering plant in Colorado, following the skinning of cattle carcasses that had been brought to the rendering plant for disposition.

REFERENCES

1. Stein, C. D., and Van Ness, G. B., A Ten Year Survey of Anthrax in Livestock with Special Reference to Outbreaks in 1954. *Vet. Med.*, 579 (Nov.), 1955.

(Continued on page 542)

EDITORIAL COMMENTS

Business and Economic Principles can be Applied to Veterinary Practice

There can be no question but that veterinary medicine as a profession has been deeply concerned with the economic facts of life. Paucity of comment on the subject is remarkable because practitioners and others who discuss economic problems are often unfamiliar with its principles. A recent attempt on the subject in the *Journal of the American Veterinary Medical Association* (p. 562, June 1956) is even more remarkable because it summons misinformation for a premise and an obscure tautology for proof.

The A.V.M.A. writers accept the dictionary definition which defines economics as "the science that investigates the conditions and laws affecting the production, distribution, and consumption of wealth or the material means of satisfying human desires." This glib definition falls headlong into an error for which even professional economists have had occasion to reproach themselves. It apparently defines the problem on the individual level and then by some sort of multiplication, similar to the way a variable might be elevated to the *nth* power, raises it to the cultural level. Webster was no economist, and his lexicon might suffice for vernacular conversation. But to any social scientist, the error is at once apparent.

Professor Robert Lowie's dictum, *omnis cultura ex cultura,* has defined the plane of observation from which any student of the subject must proceed. Every cultural phenomenon is derived from some other cultural phenomena, and can therefore be explained only in terms of other cultural phenomena. Economics is a cultural phenomenon. As a discipline it purports to study value.

Unlike David Ricardo, there are few economists today who see the science of economics as an "enquiry into the laws which determine the division of the products of industry amongst the classes who concur in its formation" and who find an inquiry into the nature and cause of wealth "vaine and delusive."

Great strides have been taken in forming a coherent picture of economic theory during recent years, perhaps the greatest being Keynes' intellectual repeal of Say's Law of Markets. This theorem, it may be noted, states that the act of production provides the purchasing power—neither too much or too little — for full consumption. Perhaps the economy may create its own market (or be made to do so, as has been demonstrated by the last three presidents of the United States), but no single producer does. The veterinary profession can not create its own market, any more than its leaders can ascend into space in a manner ascribed by legend to Mohammed's coffin. What Keynes pointed out, and what the A.V.M.A. writers failed to appreciate, is the fact that laws affecting the production, distribution, and consumption of wealth on the economic level of a nation are not "directly" applicable to any particular segment of the economy. They confuse macroeconomics with the subtle ramifications of microeconomics. That the dichotomy should be proposed, then remain unanswered, does not help members of the profession to be "better informed on the subject."

Professional economists have been aware of this difficulty. Some have responded by writing off economic theory as an impossible job and dedicating themselves to empirical studies of, say, the hog production and dairy industries. To them economics is nothing more than the study of price relations. We can neither deprecate nor deplore this situation for the simple reason that we need this information. We also need the information sought by the latest A.V.M.A. "economic survey." But we may as well face the fact that either the "social and economic facts upon which our professional relationship to society is based" mean something or they do not. If they have meaning, what is that meaning? If they are merely a matter of business forecasting, they can not correctly be termed what have been historically been recognized as economic studies. At bottom, economics is the study of value, and value is based not only on production, consumption, and distribution of material means of satisfying human desires, but also on ethical, ceremonial, and institutional considerations.

The absurdity of suggesting that a veterinarian is essentially a businessman is at once

apparent. No veterinarian would suggest that his market operations are more important to the community than disease control efforts and medical care of disease stricken animals. While it may be necessary for the practitioner to know the market — and any doctor who achieves proficiency might do well financially to give up medicine and become a broker—it must nevertheless be pointed out that a community of brokers can treat no animals or inspect no meat.

Veterinarians should be invited to make the distinction between principles and problems: Principles indicate what can and must be done about the problems. Businessmen may be absolved from thinking in this manner, but economists must know the bearing of a particular industrial situation on the economy at large. This can not be possible without an understanding of the meaning of the economy. No such meaning emerges from empirical studies. (We deny that "value" is the relation between a given commodity and other commodities; the correct term for this relationship is "price ratio"). That a veterinarian's fees vary such and such with the price of hogs in Iowa might be demonstrated, but it can not reveal the meaning of the economy.

The truth of the matter is that economics can not disavow ethical implications or institutional arrangements, because to do so would be to reassert the ancient kindergarden nonsense that wants are primary, and resources fixed by the niggardliness of nature, and that, therefore, both are "given" quantities in an empirical investigation.

Wants are social habits cemented into place by institutional arrangements. People can and do use meat or poultry products because of a social habit; they can and do switch from the use of butter and cream to substitutes manufactured without reference to veterinary science. While giving lip-service to the contrary, no businessman assumes that wants are unlimited. Any successful businessman knows that markets must be created, and once created, retained.

Resources are not fixed by nature. They are defined by the state of the arts, and adjusted by institutional sanction. For these reasons alone, business forecasting — which considers given quantities — can not be considered economic theory.

Today no veterinarian can long ignore, as any Secretary of Agriculture discovers within two weeks after taking office, that certain sectors of the economy differ markedly from others. Agriculture, without price supports and crop quotas, is highly competitive. It is free enterprise in the classical tradition. But the farmer must buy the machinery he needs in a market where oligopolistic business practices and a more restrained brand of trade are practiced, and where price fluctuation does not bend to the tune of supply and demand. He buys his veterinary services from a profession that has high standards and therefore a restricted number of graduates. This classic example of one sector of the economy fluctuating in relation to the whole has become a barometer in economic science. No spokesman in either political party dares contradict this strange economic fact which is of great importance to at least one section of those practicing veterinary medicine. The differential advantage that the producer of meat products does or does not enjoy in relation to the rest of the economy reflects itself in the veterinarian's practice.

These concepts are not too recondite for the average veterinarian to consider. Ideas, both when they are right and when they are not, rule the economic world. They act as a prime mover. A sizable section of the veterinary profession sells its services for exactly the same reason that people buy the services of a physician. Small animal clinics do not deal in the "economic driving force" that perhaps affects other sectors of the veterinary profession. For this group at least there is nothing about the unique character of veterinary medicine that makes the accepted principles of ethical business inoperative. Any business must provide service.

Veterinarians who help define the state of the arts in animal husbandry, beef production, and marketable meat products with attention to zoonoses as well as economy of operation are not merely submitting the scientific to the sufferance of an "economic driving force," any more than physicians submit the "economic driving force" of a healthy nation to the sufferance of scientific pursuit for its own sake.—*C. W.*

▼ ▼ ▼

Anthrax in Livestock

(Continued from page 540)

2. Communicable Diseases Summary for Week Ending December 31, 1955, Released January 5, 1956. U. S. Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics.

3. Van Ness, G. B., and Stein, C. D., Soils of the United States Favorable for Anthrax. *Jour. Am. Vet. Med. Assn.*, 128:7 (Jan. 1), 1956.

Aroused Awareness of Highway Hazards

In 1955, more than 15,000 individuals didn't return home after the pleasures of the weekend. According to figures recently published by the Safety Service of The Travelers Insurance Companies of Hartford, Connecticut, 15,730 Americans were killed in weekend traffic accidents.

Of last year's traffic fatalities, more than one-fifth occurred on Saturday.

The reasons for this record number of weekend highway fatalities lie in the motoring habits of the American public. Every highway in the nation has its Saturday share of that portion of America bound and determined to arrive at its weekend destination in time for dinner, even if the trip's last 60 miles must be covered in an hour flat. Too frequently, the strain and fatigue of distance driving are ignored in anticipation of ample relaxation at the journey's end.

Then, too, our highways continue to be filled with those drivers whose idea of relaxation is an extra drink or two "for the road."

Millions of dollars have been spent by federal, state and municipal authorities in an effort to provide better and safer roads. Additional millions are spent by insurance companies and other private organizations for programs of safety education.

Nevertheless, the weekends of 1955 saw more persons killed and injured on our highways than ever before. The fault lies with pleasure-bent individuals striving to go too far, too fast, for a weekend's enjoyment.

▾ ▾ ▾

The Muffly Retriever

Sharp metallic objects cause inestimable loss to dairymen in addition to the direct loss of good cows suffering traumatic gastritis.

The magnetic retriever designed by Dr. J. A. Muffly, Lewisburg, Pa., has proved a valuable apparatus in many cases. Doctor Muffly stated at the Missouri Short Course for Veterinarians recently that three cows of four are benefited by its use.

During a demonstration before a television audience Doctor Muffly retrieved two staples and two nails that were given a cow for demonstration purposes plus some miscellaneous metallic objects not accounted for and probably swallowed earlier.

Doctor Marshak Accepts Professorship to Pennsylvania School

Dr. Robert R. Marshak

Dr. Robert R. Marshak, Cornell '45, Springfield, Vt., has been appointed Professor of Veterinary Medicine and Chairman of the Department, School of Veterinary Medicine, University of Pennsylvania, Philadelphia. He succeeds Dr. John D. Beck, who resigned to accept a new post with the New York Women's League for Animals. He will assume his new duties on January 1, 1957.

▾ ▾ ▾

Historical Scurvy

Scurvy has been known since the middle ages, at least, and was once a prevalent European disease. Its ravage decimated armies and ship crews; nor was it respector of age or race. Not until the 18th century was the antiscorbutic value of certain food recognized. The economic effect of its ravages limited progress in all effort. Knowledge that certain foods, containing lavish amounts of vitamin C, are preventive marked a turning point in world progress.

"On the Medical Team to Guard Your Health"

To foster better understanding between all five licensed professions including physicians, veterinarians, dentists, pharmacists, and nurses, the Cincinnati Academy of Medicine, in December of last year assumed initiative on the premise that the best medical care for every citizen is a task requiring the cooperative efforts of all five professional groups. Representatives were invited to a dinner at which time mutual objectives and problems were discussed at length. From these discussions it was learned that two important items predominated in the thinking of the group.

The first was the necessity for sound public relations which pointed out services the public health team were prepared to render. It was noted that common grounds of interest ought to be sought since members of respective groups were unfamiliar with the problems of the others. It was affirmed that in the field of public relations, a great opportunity presented itself for education of the man on the street on the devoted effort of each member of a medical team organized to maintain a healthy citizenry and environment. Contributions made by the licensed professions to the health and welfare of the community will be brought to the attention of the public as opportunity and financial resources are made available.

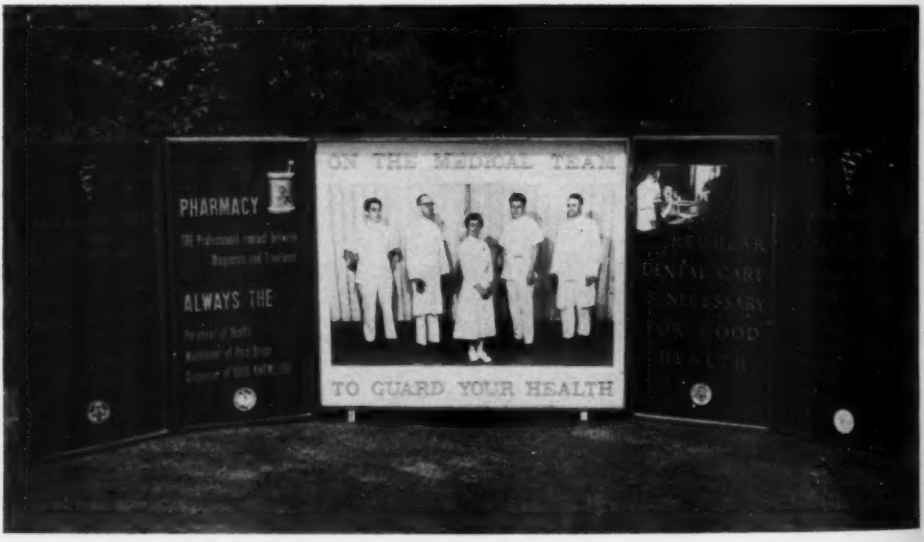
Secondly, such a cooperative effort could produce appropriate benefits to the individual professions in the field of public policy and legislation.

In order to implement these projects a Committee was formed consisting of an officer and the chairman of Public Relations from each profession. This Committee was to investigate and formulate a program to be carried out by the group in the above fields.

The first project (pictured below) was developed of an exhibit, the purpose of which was to depict the interprofessional relations between the licensed professions, and to demonstrate their team work in safeguarding public health and welfare.

This striking and attention demanding exhibit has met with enthusiasm both from members of the profession and the public where it has been shown thus far. It will continue to be shown at many scheduled meetings as an educational exhibit. It is also scheduled to be on display to the public in banks, schools, and public buildings.

A magnificent start has been made by the Cincinnati Academy which has already embarked enthusiastically on other projects (1) to stimulate interest of members of the five professional groups in the maximum of cooperative efforts to serve the public health, and (2) to develop awareness of the public of the little publicized services of the organized groups of professional people. The veterinary profession takes its rightful place on the medical health team.



POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Resume of Selected Papers Presented at 45th Annual Meeting of Poultry Science Association

A number of papers presented at the 45th annual meeting of the Poultry Science Association held August 7-10, 1956 at Raleigh, N. C. were of direct interest to veterinarians. Abstracts of these will be published in the September issue of *Poultry Science* and many of them will appear in detail in later issues. Brief reviews of selected topics are given below.

Effect of Antibiotics on Growth

C. W. Carlson, South Dakota Agricultural Experiment Station reported six years work on effects of feeding antibiotics to layer and breeder flocks. His results indicate that antibiotics may have beneficial effects in hens laying at a submaximal rate and producing eggs with submaximal hatchability. Another paper on this subject by J. D. Price, *et al.* of Texas A. & M. College, confirms Carlson's observation. They also reported that 3-nitro-4-hydroxy phenylarsonic acid, 22.5 mg. per lb. of feed increased egg production 4 to 6% and improved feed efficiency. The influence of aureomycin®[1] on productive performance of broilers was discussed by Drs. K. C. Seeger and R. J. Price of American Cyanamid Co. Feeding 100 gm. per ton of feed continuously for ten weeks or the equivalent in water gave an increased growth response and feed efficiency as compared with controls. In their trials they observed that when Newcastle disease and infectious bronchitis vaccines were used, deaths characterized by respiratory lesions were reduced in proportion to the aureomycin intake.

Tenderization of Processed Poultry

L. E. Dawson, *et al.* of Michigan State University reported on the effects of time interval between slaughter and freezing on toughness of fryers. According to their findings poultry processing used to take longer than it does now and the waiting period between the slaughter of the bird until it was frozen favored tenderization. The time period between these operations now is negligible resulting in an increase in toughness.

Research at Michigan State has indicated that there should be at least a six-hour holding period prior to quick freezing to give poultry time enough to age to insure proper tenderness. In another paper on this subject, A. A. Klose, *et al.* of the USDA Regional Laboratory at Albany, Calif., emphasized that such a holding period means higher cost and is a blow to efficiency. Their research with turkeys and chickens is aimed towards finding methods to improve tenderness by other than holding at room temperature before freezing.

Antibiotics and Shelf-life of Dressed Poultry

Increasing shelf-life of processed poultry was a popular subject discussed in the Marketing Sections. A number of antibiotics are now available which will cut down on spoilage and increase the shelf-life. It was the consensus however that modern-day drugs can only be considered as adjuncts and not substitutes to sanitation in processing, cooling, packaging, and proper storage refrigeration for the production of a wholesome, stable poultry product. To control yeasts and molds which tend to increase following use of antibacterial antibiotics mycostatin®[2] an antifungal antibiotic combined with aureomycin was tried by H. Yacowitz, *et al.*, Squibb Institute. Their experiments demonstrated that combinations of 10 p.p.m. of aureomycin plus 15 to 30 units of mycostatin per ml. of dip solution resulted in adequate control of yeasts and molds. (See *Vet. Med.*, Sept. 1956, page 449 for another item on this subject).

Diseases

The papers on diseases were largely concerned with effects of various treatments and vaccines on prevention and control. M. S. Cooper and G. R. Personeus of American Cyanamid Company reported on the duration of immunity in turkeys given an adsorbed erysipelas bacterin. Their results indicate that turkeys can be immunized against this disease, and that the dose concentration and the longer

®[1]Lederle Laboratories Div., Am. Cyanamid Co., Pearl River, N. Y.
®[2]E. R. Squibb & Sons, New York, N. Y.

persistence of greater volume of vaccine used are critical factors in determining duration of immune response.

Nitrofuran drugs were reported as effective in treatment of cecal coccidiosis by C. A. Johnson of Harvard University and in treatment of infectious sinusitis by S. C. Schmittle of Michigan State University. Johnson found that soluble furacin®[a] mix in a concentration of 0.008% given in drinking water on the day of infection, the day after infection and two days after infection prevented mortality from this disease. Schmittle injected 50 mg. of furazolidone (NF.180) into each sinus of infected turkeys without aspiration of the exudate and obtained 78.7% recovery from a single treatment. In treatment trials to compare furazolidone (NF.180) with other drugs for treatment of synovitis of broilers, D. C. Shelton, *et al.* of West Virginia University found that aureomycin was superior.

The pathogenicity of *Eimeria acervulina* was discussed by M. F. Morehouse and W. C. McGuire of Salsbury Laboratories. They found that a single crop inoculation with 5,000,000 oocysts produced 6.3% mortality while the same quantity given on two and three consecutive days resulted in 12.2 and 21.0% losses. Twenty million oocysts given for two days caused equal mortality (75%) to 5,000,000 given for four to five consecutive days.

Preliminary studies on the etiology of transmissible enteritis (bluecomb disease) were reported by J. McN. Sieburth and E. P. Johnson of Virginia Agricultural Experiment Station. The primary agent according to them appears to be filterable and antibiotics resistant. They believe that the infective agent may incite an intestinal infection aggravated by antibiotic susceptible intestinal microflora, and thus the syndrome seen may be due to a synergistic mixed infection. These investigators think that the disease in turkeys is not caused by the same virus as causes the so-called bluecomb of chickens although it is closely related.

▼ ▼ ▼

According to Dr. John V. Quaranta, (*Science Digest*, 36:4, [Oct.], 1954) chickens and pigeons are able to discriminate between red, yellow, green, and blue-green and have maximum sensitivity to yellow-green. Pigeons can also discriminate between violet and other colors.

®[a]Eaton Laboratories, Norwich, N. Y.

Social Security Benefits for Veterinarians

Benefits for self employed veterinarians under provisions of the Social Security Act, as amended and signed by the President last August, will be available after April 1, 1957. No benefit payments will be made to the families of those who die prior to that date. The reason lies in the requirements that benefits are not payable without a minimum of six quarters (or parts of six quarters) of coverage after January 1, 1956, retroactive date of the new law.

If a veterinarian dies between now and April 1957, his family will not be paid social security payments yet his estate is liable to payments of 3% of net income up to $4,200. for 1956 and 3⅜% of that earned in 1957. If death occurs after April 1957, social security benefits are payable to survivors. The amount is scaled according to wage credits and surviving under age children.

The Research Institute of America (*Taxation Report*, Aug. 23, 1956) states that professionals embraced under the new provisions "become worth $50,000. more to their families."

Support of this statement is given in a table illustrating payment to widows with children. An example of the total potential dollar benefit of a wife whose age at her husband's death is 30 years and whose youngest child is one year old, might realize an income totalling $55,200. considering life expectancy of survivors. This amount is of even greater value since payments are free of normal income or estate taxes.

The Research Institute recommends that newly covered professionals take additional short-term (one year) life insurance to assure that premature death does not rob their families of their potentially large social security benefits.

▼ ▼ ▼

Eggs are approximately two thirds water and one half the total weight of a hen is water. These facts emphasize the need for giving laying hens an ample supply of water at all times. Under normal conditions 100 hens will drink seven gallons of water per day.

▼ ▼ ▼

At least 15 microorganisms have been incriminated as etiologic agents in the bovine mastitis complex.—*Vet. Sci. News.*

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

Parakeratosis of Swine

Pathologically, so-called parakeratosis of swine seems to consist primarily of an edema between the layers of the cells in the stratum corneum which prevents the formation of keratin, the latter the base of epidermis, hair and horny tissue. As a sequence the clinical manifestations such as loss of hair, and thickening and cracking of the skin in various parts of the body are observed, painful joints and feet are noticed in advanced cases. Researchers are quite well agreed that there is a zinc deficiency, and that an excess of calcium in the ration may be a contributing cause. It is even hinted that the trend to rations having low protein values—away from tankage and meat scraps, both good zinc sources—may be at the bottom of the disease. Strained bonemeal, it has a fair zinc content, has frequently been misplaced by ground limestone—the latter low or entirely absent in its zinc content; however, in the rations of growing pigs should not contain more than 0.8% of calcium. The feeding of trace minerals has been suggested as a palliative measure, and Alabama researchers (Salmon and Tucker) apparently have prevented the trouble in pigs on dry feed by the addition of 0.2 lb. of zinc carbonate in each ton of feed, or twice this dosage if the disease is already present. Lush pasture is helpful in the handling of the ailment.

▾ ▾ ▾

Virus Carriers of Vesicular Exanthema

From an erroneous report, we gathered information that the virus of vesicular exanthema of swine had been isolated from clinically recovered cases of disease, and it was so reported in this column. From additional sources we have now been informed that the researchers isolated the virus from the tissues of slaughtered hogs, the latter derived from a group in which vesicular exanthema had existed 90 days previously. "It was impossible, however to conclude that the hogs were not in the stage of incubation." It was also made clear that, "A number of trials have been conducted with various types of vescular exanthema virus to demonstrate a carrier state with convalescent hogs, however, all attempts have failed."

Fluoridation of Municipal Water Supply

Fluoridation of potable water is still quite a controversial subject in many communities that have not taken this step to control human dental caries. Many cities have taken this prophylactic measure, and it is reported that America's two largest cities, New York and Chicago, may soon join the ranks of those where fluoridation is an accomplished fact. The principal objections are those based on religious concepts that seek to avoid all forms of medication, and from those that fear that fluorosis as exhibited principally by mottling of the teeth, or other systemic effects of fluoride ingestion may develop. The usual approximately 20 mg. of fluoride in each five gallons of water (this is the amount when one part per million is the strength of city fluoridated water) is well within the safe range. On ingestion of ten times this amount there was no evidence of osteosclerosis. When fluoridated water is supplied constantly, a significant fraction is promptly excreted in the urine because resorption of fluoride in the kidney tubules is much less than of chlorides. As one writer states, " . . . studies point to the same general conclusion, namely in the dosages currently used, the assumed hazards to the human population are either nonexistent or negligible." Still another statement is that, "There is some indication that the ingestion of excessive fluoride in water . . . may, on occasion, have a beneficial effect in adult bone, such as counteracting the osteoporotic changes of the aged." Veterinarians in smaller communities, having no resident physicians, should be leaders in discussions when fluoridation (that is the addition of fluoride of soda in strengths of one part per million to the drinking water) is contemplated.

▾ ▾ ▾

Mastitis in Sows

Many cases of mastitis in sows are related to metritis. One intrauterine infusion of posterior pituitary extract in suitable menstrum is generally followed by prompt relief of symptoms and satisfactory nursing of pigs.—*W. E. Boucher, D.V.M.*

PUBLIC HEALTH

JAMES H. STEELE, D.V.M., M.P.H.

Atlanta, Georgia

Silo Fillers Disease

A newly recognized syndrome among farmers, described as "silo fillers disease" is caused by nitrogen dioxide inhalation according to Drs. Thomas Lowry and Leonard Schuman of the University of Minnesota Medical School. The authors described the entity as a dangerous disease of the broncho-pulmonary system. Basically the condition is a highly lethal form of bronchiolitis obliterans caused by the inhalation of nitrogen dioxide gas emanating from recently filled silos. Of the six cases reported, four had extensive bronchiolitis obliterans; one developed probable bronchiolitis with widespread lobular pneumonia, and recovered spontaneously; the sixth patient, presumably because he had inhaled the toxic agent in high concentration, died of rapidly progressing acute inflammatory edema of the lungs.

The authors point out that they were not able to find any record of human bronchiolitis caused by exposure to gas or fumes evolved by fresh silage. There are a number of references to fatal bronchiolitis obliterans resulting from accidental inhalation of nitrogen dioxide in industry and in chemical laboratories. A probable explanation for the absence of earlier reports is the apparent rarity of this condition; in all likelihood, the production, in a silo, of nitrogen dioxide concentrations sufficient, when inhaled, to cause bronchiolitis depends upon a particular, unusual combination of chemical circumstances. Experimental work now in progress should eventually yield information about these circumstances.

Drs. Lowry and Schuman point out that this is a clearcut, specific entity, not previously described nor recognized as an occupational hazard in agriculture. It produces a striking clinical syndrome. A history of recent exposure to irritative silage fumes is the essential evidence which identifies this condition, and differentiates it from the other similar entities. The six cases described all occurred in healthy males ranging in age from 28 to 48 years. Three of the six cases were fatal; two were young brothers who had only a brief exposure while attempting to open a ventilation door near the top of the silo which had been filled with corn the previous day; the other death was a fulminating illness in an individual who filled his silo with dry clover mixed with water. He died within 36 hours after exposure.

The pathological features of the disease are distinctive. The lungs contain innumerable uniformly distributed lesions, which are grossly visible and palpable as firm, discrete nodules of miliary size. Microscopically, each nodule consists of a small bronchus or bronchiole filled with a rather cellular fibrinous exudate. Organization of this adherent plug of fibrin by ingrowth of fibroblasts from the bronchial wall effectively occludes the lumen. It has been shown clinically and experimentally that the oxides of nitrogen as well as certain other toxic gases are capable of producing the disease. These others include phosgene, chlorine, chloropicrin, ammonia, hydrogen chloride, and probably sulfur dioxide.

"Farmer's Lung"

The authors call attention to another condition which may have the same etiology, "Farmer's Lung," which is a chronic bronchitis, pulmonary fibrosis, or pulmonary emphysema. This condition is seen more frequently among farmers than any other occupational group. This entity will be studied further to determine if inhalations of low concentrations of nitrogen oxide may be the cause.

Prevention, according to the Minnesota authorities, is as follows:

1. Allow no entry into a silo from the time it is filled until 7-10 days later.
2 Provide good ventilation about the base of the silo so that gases, if they develop, will be carried away.
3. Block off area around silo so children and animals can not stray into any areas where gas may accumulate.

The authors state that most farmers know that a silo is dangerous the week immediately following filling, but often their actions do not reflect this knowledge. They also do not wish to infer that silos or silage should be abandoned. They wish to define a limited danger that does not exist against which precautions can be taken.

They are now working on a color paper test to be used in silos which would give a specific color change in the presence of nitrogen oxide or tetroxide.

Sulfacaine PUFTUBE

Now Sulfacaine Puftubes feature a "new look and a new formula" that means easier use and greater effectiveness in treating eye-ear inflammations and minor wounds in all species.

NEW, IMPROVED FORMULA

Sulfanilamide	55%	Long-lasting antibacterial action
Sulfathiazole	25%	Broadest antibacterial sulfonamide
Neomycin Sulfate	35.5 mg.	Controls microbial infections of eyes and ears
Phenacaine Hydrochloride	1%	Local anesthetic relieves itching and pain

NEW PLASTIC PUFTUBE

Apply Sulfacaine easily and quickly with the new plastic squeeze "puftube" — permits controlled distribution of the powder into — eye, ear or on wound.

INDIVIDUALLY PACKAGED

Each 0.25 oz. plastic puffer tube is individually boxed with direction label under tear-off formula flap.

Carton of 12 ..... $6.15

Norden® **NORDEN LABORATORIES** LINCOLN, NEBRASKA

VETERINARY NUTRITION

MORRIS ERDHEIM, D.V.M.
Chicago, Illinois

Vitamins and Resistance to Disease

The relationship between vitamin B deficiency and lowered resistance to infection has been the subject of many studies. Working with dogs, Rose[1] reported that dogs on a B vitamin deficient diet were more susceptible to the deleterious effects of artificial infection with *Staph. aureus* than dogs eating the same quantity of the same diet fortified with the B complex. Moreover, the surviving dogs on the B-deficient diet had positive blood cultures for a longer period (12.2 days *vs.* six days for the control animals).

Recent studies carried on at North Carolina involved the increase of resistance to a specific disease organism (*Salmonella gallinarum*) by feeding chicks with diets containing higher than normal levels of all the known vitamins. In these tests[2], increasing the vitamin levels to ten times the levels normally used in feeds increased the survival time and rate of survival of chicks experimentally inoculated with a culture of *Sal. gallinarum*. The percentage of surviving chicks was increased from 10% in the group on the normal diet to 40% in the group on the high vitamin diet. The survival time was also increased.

In an attempt to determine the effect of specific vitamins, it was noted that the complete vitamin supplement promoted greater resistance early in the post inoculation period. Some of the vitamins, such as vitamin K, must be increased over the requirement for growth many times more than others, such as choline, in order to bring about increased resistance to typhoid.

Vitamin C which had been included in the vitamin mixture, was found to be essential for the desired results. DPPD, which has been used as an antioxidant for poultry feeds, was even more effective than the vitamin C when it replaced the vitamin C in the vitamin mix. Neither vitamin C nor DPPD alone was effective in increasing resistance to fowl typhoid. Apparently, the effects of the vitamin C are due to its antioxidant properties, since it can be effectively replaced in the diet by another antioxidant.

In a Texas test[3], two groups of broilers were exposed to CRD at six weeks of age. One group was on a conventional broiler feed fortified with vitamins. This conventional diet has produced birds weighing 3.0 to 3.25 lb. at 8½% weeks with a feed conversion as low as 2.26[4]. The second group was on the same feed containing higher levels of these vitamins. The feed for both groups contained a coccidiostat, an arsenical, and penicillin (2 gm.) and bacitracin (5 gm.) added per ton of feed[4].

Following exposure to CRD, the group on the conventional diet gained weight much more slowly than the group on the higher-level vitamin diet. The first group averaged 3 lb. ten days after the second.

Working with a single vitamin, pantothenic acid, Bean of Iowa was able to show that the characteristic deficiency symptoms in man include "almost continual infections of the upper respiratory tract." Bean fed his subjects a diet devoid of pantothenic acid to which a metabolic antagonist of the vitamin was added, to insure a pantothenic acid deficient state.

When the antagonist was discontinued, and pantothenic acid was added to the diet, the infections cleared up and did not recur during the recovery period.

In the next column in this series we hope to explore possible modes of action of the vitamins as agents which increase resistance to disease.

REFERENCE

1. Rose, S. B., Rose, W. B., Bacterial Resistance in B-Deficient Dogs. *Jour. Inf. Dis.*, 59:174, 1936.
2. Hill, C. H., Garren, H. W., The Effect of High Levels of Vitamins on the Resistance of Chicks to Fowl Typhoid. *Ann. N. Y. Acad. of Sci.*, 63:186, (Oct.), 1955.
3. Camp, A. A., Good Nutrition Helps Ward Off CRD. *Broiler Growing*, Feb., 1956, p. 15.
4. Personal communication.

▼ ▼ ▼

Muscovy ducks will not cross with other ducks. This duck originated in Brazil, and in that country is not considered to be either a duck or a goose, but is called by the name of "Pato." The incubation period of Muscovy eggs is 35 to 37 days as compared to 28 days for other duck eggs and 30 to 34 days for goose eggs.

WHEN ONE VETERINARIAN
tells you about Vitamineral products, *you listen...*
WHEN A DOZEN
recommend VpC supplements, *you're impressed...*

BUT WHEN OVER

8,000

—licensed graduate veterinarians—recommend and dispense Vitamineral supplements *there can be no doubt!* VpC products *are* a vital benefit to the livestock and poultry in your charge . . . a definite money-maker and money-saver for your clients . . . an exclusive prestige item for the veterinary profession.

TODAY, WRITE FOR
THE NEWEST EDITION
OF THE VpC
VETERINARIAN'S FEED BOOK

SOLD TO VETERINARIANS ONLY
VITAMINERAL
PRODUCTS COMPANY
PEORIA 3, ILLINOIS
Dependable supplement feeds since 1915

Classified Advertisements

Twenty-five words or less, $3.50—minimum charge; additional words, 10 cents each. Replies sent care VETERINARY MEDICINE. 50 cents additional to cover forwarding postage. Remittance must accompany order.

Names of classified advertisers using V. M. key numbers cannot be supplied. Address your inquiry to key number, care VETERINARY MEDICINE, Suite 803, Livestock Exchange Building, Kansas City 2, Missouri, and it will be promptly forwarded to the advertiser.

To assure inclusion, copy must be supplied by the 5th of the month preceding date of issue (January 5 for February issue: February 5 for March issue, etc.).

FOR SALE: Mixed practice—long established. Fully equipped small animal hospital. Nine room house included. Dr. E. Garner, E. Main St., Mendham, N. J.

WANTED: Veterinarian assistant in a small animal hospital, Chicago suburb. Chance for future. Address Box 334, care VETERINARY MEDICINE.

ANY DOG BOOK: Breed books—$3.50 each—Boston, Dachs, Peke, Springer, Dane, Chihuahua, Boxer, Cocker, Springer. St. Bernard ($4.50). For anything printed on dogs or for kennels—address Judy Publ'g Co., Dog World, 3323 Michigan Blvd., Chicago 16.

OPPORTUNITY: Nationally established ethical Manufacturer-distributor of veterinary pharmaceuticals offers immediate opportunity, for man qualified and/or experienced, in the production of veterinary pharmaceuticals. Address Box 330, care VETERINARY MEDICINE.

FOR SALE: A beautiful and highly functional modern home with attached office-hospital is for sale at $35,000 in a prospering southeastern Vermont community of 9,000. Location on hillside offers privacy and one of the most extraordinary views in the state. A lucrative mixed practice offers a large income from clients who desire and expect the practice of good veterinary medicine. Address Box 336, care VETERINARY MEDICINE.

WANTED: Sales representatives wanted (4) to call on veterinarians only in Illinois, Indiana, Wisconsin and the Chicago metropolitan area; to represent and detail established line of biologics and pharmaceuticals. The company is one of the leading, established ethical producers. Our employees know of this ad. Please state experience, salary expected in first letter. Address Box 337, care VETERINARY MEDICINE.

FOR SALE: Two good used two way radio mobile units ready to go complete and in excellent condition. One can easily be modified for a base station for about $100.00 and includes base tower. Price $800.00. Dr. E. C. Lunn, Malta, Illinois.

WANTED: January, March, May and July, 1956 issues of VETERINARY MEDICINE. Your subscription will be advanced one month for each copy. Mail to VETERINARY MEDICINE, Suite 803 Livestock Exchange Bldg., Kansas City 2, Missouri.

▼ ▼ ▼

Development of tailless sheep is a project of the South Dakota Experiment Station. Siberian tailless rams were imported and have been crossed with a number of common breeds. Tail length of first cross lambs appear to be reduced by 2 to 4 inches.

MASON'S New KENNEL RUNS
NOW AVAILABLE
For SMALL ANIMAL HOSPITALS
Quickly Erected - NO POSTS REQUIRED
Can be set on concrete or wood floors or directly upon the ground, joining to, or independent of Building. Composed of strong, self-supporting Fence sections and Gate Units with GATES BUILT-IN and Lockable Latches.
FREE CATALOG
Send for Free Catalog with Low Direct Factory Prices of Kennel Fences of all kinds, Kennel Doors, Cages and Hospital Equipment.
THE MASON FENCE CO., Box 77, LEESBURG, OHIO

Dipping Pigs for Lice

The practice of dipping pigs for lice at vaccination time has not only provided a useful service for growers but has been a vital practice builder for Dr. W. E. Boucher, Griswold, Ia. Doctor Boucher has designed a handy, portable vat that will handle pigs up to 70 lb. weight. The vat is placed outside the pen gate or fence and as pigs are vaccinated they are placed in the dip back down. Pigs roll over and climb out thoroughly treated. Benzene hexachloride solution is recommended for the vat charge.

Doctor Boucher claims that it involves no extra work while pigs are being handled.

▼ ▼ ▼

LOOK
to us for
PHENOTHIAZINE AND PHENOTHIAZINE-LEAD ARSENATE
POWDER, wettable: 1#—$8.50/dz., 10#—$6.30, 25#—$15.50, 100#—$52.00, 150#—$73.50
BOLUSES: 12½ gm. $3.35/hundred, 8 gm. $2.90
WHEAT GERM OIL: $13.60/gal., $3.60/qt., $2.10/pt.
SODIUM PROPIONATE NF: 5#—$3.60, 10#—$6.75, 25#—$15.75
SULFA DRUGS: Powder, tablets & boluses.
LIVESTOCK CHEMICAL CO.
Manufacturing Chemists — Since 1939
Box S-765 Grand Rapids 8, Mich.

Omohundro to Head USDA Poultry Disease Eradication Programs

Appointment of Dr. Richard E. Omohundro, KSC '37 as head of poultry disease eradication programs in the Animal Disease Eradication Branch of the Agricultural Research Service, U. S. Department of Agriculture, effective July 29, has been announced by Dr. C. D. Van Houweling, director of USDA livestock regulatory programs.

Doctor Omohundro was formerly stationed in Jefferson City, Mo., as veterinarian in charge of USDA animal disease eradication activities in Missouri, a post he had held since October 1952.

His responsibilities in his new position in Washington, D. C., include the planning and development of federal-state cooperative programs for control and eradication of poultry diseases, and coordination of the activities of poultry diagnostic facilities throughout the country. Under Dr. R. J. Anderson, chief of the Animal Disease Eradication Branch, he will serve also as area director of USDA livestock disease eradication activities in the north central states, including Michigan, Illinois, Ohio, and Indiana.

BOVIDOTE

for ruminants

Detoxicant—Antacid—Stimulant—Laxative

The practitioners choice in green corn, soft corn and other forage poisonings.

Especially useful in intoxications, retarded bowel action and rumen stasis.

Regardless of cause—whether poor feed or disease—anything producing retardation of digestive processes promotes aberrant fermentation, resulting in toxic products.

NO OTHER PRODUCT on the market has the combined detoxifying and laxative ingredients in the formula in sufficient quantity to be **AS EFFECTIVE AS BOVIDOTE.**

dozen 1 pound.... 9.90 3 dozen.....28.80
6 dozen.....55.80 25 lb. drum.....18.25

CURTS laboratories
FORMERLY CURTS FOIST
Pharmaceutical Manufacturers to the Veterinary Profession - Since 1918
KANSAS CITY, KANSAS

PEDRICK LABORATORIES, SAND SPRINGS, OKLAHOMA

Please send ☐ Samples ☐ Literature of the NEW PRO Brand Animal Foods. 3

Dr._____

Address_____

City_____State_____

(Advertisement)

Research Reveals Highly Effective Anthelmintic for Cattle

The results of recently intensive clinical research revealed an anthelmintic that is highly effective in killing intestinal parasites in cattle. Individual animals were confined in special stalls and administered different phenothiazine drench formulations for testing. All urinary and fecal excreta were recovered and each excretion was individually analyzed chemically to detemine how much of the dose went into the digestive tract and amount of the dose available for killing worms. Dosages were given on an identical basis.

GREATER CONCENTRATION

Results obtained from this modified formulation were better than that of unmodified drenches generally used. Tests show that modified formulations produced on the average 6 to 8 times more phenothiazine in the digestive tract in a shorter period of time than other drenches. For example, peak percentages (above 1%) of the modified chemical were obtained in only 17 hours post treatment while the average of unmodified formulations returned a peak percentage of less than .2% 40 hours or later post treatment.

All statements regarding the effectiveness of the above tests are backed by documented experimental data.

Many veterinarians are using this modified formula under the professional label Pro-Brand Improved Cattle Wormer which is sold only to veterinarians. Pro-Brand is produced by Pro-Brand Products Company, a subsidiary of Texas Phenothiazine Company. For details write to Pro-Brand Products Company, P. O. Box 4186, Fort Worth, Texas.

▼ ▼ ▼

By January 1, 1957 the population of the United States will approximate 169,000,000 people; 2,800,000 more than one year before, and about 13% more than the census report for 1950.—*Printers Ink.*

▼ ▼ ▼

A minimum of one drinking space per 20 pigs is recommended for all classes of swine where groups are confined in pens or lots.

▼ ▼ ▼

Silver King
VETERINARY CHUTE
The choice of leading veterinarians from coast to coast! The only chute in the world with front and side opening!
• CATTLE CHUTES
• CALF TABLES • SCALES
• FEEDERS • CORRAL PANELS • GATES
Free Catalog
HELDENBRAND & SON
P. O. Box 2367 • Phone RE 6-5757
OKLAHOMA CITY OKLAHOMA

Hormone Pellets Stimulate Gains in Feed Lot Cattle

A natural hormone pellet implant that boosts weight gains in cattle at least one-half pound additionally a day at lower cost per pound of gain was described in a paper presented at the Colorado Veterinary Medical Association meeting, Estes Park, on September 8, by R. J. Deans of Michigan State University's Department of Animal Husbandry.

The implant product used in the Michigan State tests is a combination of two natural hormones—progesterone and estradiol—called synovex®. It was developed cooperatively by E. R. Squibb & Sons and Syntex of Ogden Corporation.

The paper presented by Doctor Deans covers an experiment with three lots of yearling steers, all fed identical rations. One lot was implanted, a second was stilbestrol-fed; the third was designated as a control group. At the end of the three month feeding period, Deans reported that the implanted steers made an "average daily gain of 3.03 lb. compared to 2.64 and 2.30 lb. for stilbestrol-fed and control steers respectively."

Feed consumption per 100 lb. gain, the report states, was lowest for implanted steers, thus indicating greater feed efficiency due to natural hormone stimulation. Additionally, the rate of gain for synovex-implanted animals, was significantly faster than for either of the other two lots of cattle.

Other major findings of the trials at Michigan as described by Deans are:

1. Steers implanted with synovex exhibited a marked increase in appetite one week after implantation, which was maintained all during the three month feeding period.

2. Increased gain in implanted steers was measurable 30 days after the trial started.

3. On the basis of slaughter performance, there were no differences in cooler shrink between the three lots.

4. Studies of the physical composition of the carcasses revealed that those from the synovex-implanted lot had a significantly higher proportion of lean indicating that apparently the injected hormones aided in increasing muscle mass.

In addition to the trials at Michigan State, Squibb and Syntex have been testing the new hormone composition extensively in commercial feed yards in various parts of the country. The results of these tests confirm the Michi-

(Continued on page XXXVI)

Ordinary mastitis ointment remains in a blob, restricting the ability of the ingredients to reach the infection.

PROOF

Terramycin®* Animal Formula for Mastitis diffuses immediately into the infected quarter

Terramycin Animal Formula for Mastitis reaches the infection quickly with full broad-spectrum action.

These photographs of translucent plastic "quarters" show the exceptionally rapid diffusion of Terramycin Animal Formula for Mastitis contrasted with the restricted spread of ordinary ointments. This is one of the reasons Terramycin Animal Formula for Mastitis is not only *effective*, but is *fast.*

Supplied: Tubes of ½ oz. and 10-dose vials. Each gram contains 30 mg. of calcium dioxytetracycline and 10,000 units of polymyxin B sulfate.

*Brand of oxytetracycline

Department of Veterinary Medicine
PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

Pfizer

no side effects from THERAPOGEN

the proven effective germicidal agent

You'll find THERAPOGEN virtually free of side effects and toxicity. Its completely effective yet mild cleansing action has been found excellent for obstetrical work by veterinarians for many of the finest horse breeding farms in Kentucky. Inexpensive THERAPOGEN may be ideal for your needs, also.

Write, wire or call today for samples, literature and the name of your nearest distributor.

THEO. MEYER Est.

213 SO. 10TH ST., PHILA. 7, PA.

Hormone Pellets

(Continued from page XXXIV)

gan State findings, *i.e.*, that synovex-implanted cattle gain significantly greater weight at a lower cost per pound of gain than other hormone-stimulation product with which it was compared. As a result of these findings, Squibb is now marketing the product nationally through veterinary practitioners.

Improper Use of Mastitis Preparations

The relatively high percentage (approximately 6%) of fluid milk sample, collected in all sections of the United States, contain variable quantities of antibiotic residues. This fact was revealed following compilation of results of a nation-wide survey conducted by the U. S. Department of Health, Education, and Welfare.

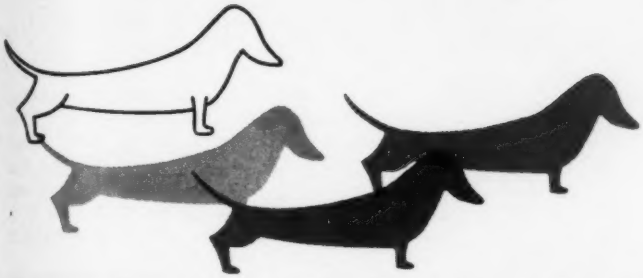
Regulations require that manufacturers include a "warning" on all labels of products containing antibiotics designed for the treatment of bovine mastitis to the effect that milk from the treated quarter or guarters must be discarded or used for purposes other than human consumption for at least 72 hours after final treatment. Results of the survey indicate widespread disregard of this warning.

Public health officials have recognized for some time possible problems that may arise from failure to withhold milk of normal appearance for the required period after treatment of infected quarters. Improper use of these mastitis preparations or failure to withhold milk containing measurable quantities of antibiotics have posed a considerable problem to cheese and butter manufacturers. It also has been made clear that milk containing antibiotics may be termed adulterated within the meaning of the Food and Drug Act.

Practitioners regularly advise their clients in regards to this matter and ought to continue to emphasize the importance of conforming to requirements related to withholding milk from market channel for the entire period prescribed.

▼ ▼ ▼

Staff members of Armour Veterinary Laboratories, Kankakee, Illinois. (L. to r.) Dr. Mark E. Davenport, Ass't Veterinary Director; Mr. John O. Gwin, Director Veterinary Division; Mr. D. V. Whitney, Chief Pharmacist and Chemist; and Dr. M. A. Schooley, Veterinary Technical Director. All manufacturing procedures have been recently moved from Kansas City, Kansas to specially prepared facilties at Kankakee, Ill. which centralizes production, research and development, accounting, marketing, and control.



thousands of clinical cases prove that...

KOAGAMIN®

parenteral hemostat

arrests bleeding in minutes
prevents excessive blood loss

A Few Cases From The Literature[1]

CASE	DOSAGE OF KOAGAMIN	RESPONSE
Fox Terrier mammary tumor	1 cc. I.M., ½ hour preoperatively	"...capillary hemorrhage decreased to negligible...."
English Thoroughbred excise lachrymal duct	20 cc. I.V., at close of surgery	"...in 10 minutes bleeding had come to a practical stop...."
German Shepherd penal sarcoma	hemorrhage 5 hours postoperatively – 3 cc. I.V.	"Bleeding lessened in 10 minutes... ceased in 20 minutes."
*Thoroughbred Gelding** amputate scirrhous cord	bleeding despite ligatures – 10 cc. I.V., 10 cc. I.M.	"Seeping hemorrhage was arrested in 10 to 15 minutes."
Terrier panhysterectomy	Profuse bleeding during surgery – 2 cc. I.M.; 2 cc. I.V., 10 minutes later	"...marked reduction in hemorrhage within 4 minutes... hemostasis in 10 minutes."

*N.B. A second thoroughbred under identical conditions but without KOAGAMIN: postoperative seeping hemorrhage – ½ hour; oozing – an additional 2 hours.

KOAGAMIN, an aqueous solution of oxalic and malonic acids for parenteral use, is supplied in 20-cc. diaphragm-stoppered vials.

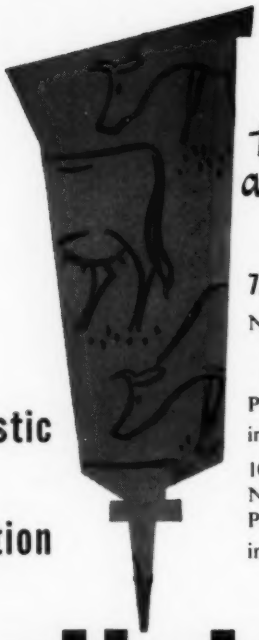
1. Rachman, M., and Frucht, T. R.: Vet. Med. *49*:341, 1954.

Chatham

CHATHAM PHARMACEUTICALS, INC · NEWARK 2, NEW JERSEY

Distributed in Canada by Austin Laboratories, Limited, Guelph, Ontario

07656



for Mastitis and topical application

A synergistic antibiotic combination

7.5 cc. tube contains:

Neomycin sulfate . . . . . 100 mg.
(equivalent to 60 mg. standard neomycin base)

Polymyxin B sulfate . . . 100,000 Units

in a free-flowing milk miscible base.

100 cc. multi-dose vials, each 10 cc. contains:
Neomycin sulfate . . . . . 100 mg.
Polymyxin B sulfate . . . 100,000 Units
in a free-flowing milk miscible base

Daribiotic*

Neomycin—Polymyxin B, Massengill

For intestinal and uterine infections

Each green oblong tablet contains:

Neomycin sulfate. . . . . 25 mg.
(equivalent to 15 mg. standard neomycin base)

Polymyxin B sulfate . . . . . 25,000 Units

conveniently packaged for dispensing in pliofilm strips.

Twenty-four individually sealed tablets per carton.

THE S. E. MASSENGILL COMPANY

VETERINARY DIVISION

Bristol, Tennessee

Kansas City • San Francisco • New York

*U.S. Pat. 2,565,057

New All-Metal Clinical Thermometer

Designed to last a lifetime, the new Cary thermometers are a radical departure from the standard glass-mercury filled instruments now in use. It is designed (see photo) to be easily read, needs no shaking down, is rapid and accurate. It is hermetically sealed and can be sterilized clinically.

Manufacturers claim accuracy and sensitivity to 0.2F. indefinitely. Dial is calibrated to 0.2F. To obtain reading, the Cary thermometer is simply inserted with the control plunger in the "out" position. Before removing, control plunger should be pushed "in", assuring unaltered reading until plunger is again pulled out. The instrument is guaranteed by the manufacturers for five years.

SPECIAL

DAIRMOL DUSTING POWDER

FOR GRANULAR VAGINITIS

Antiseptic **Astringent**

"THE DAIRMOL WAY"

Compounded under the direction of veterinarians of exceptional experience. Highly recommended by leading herdsmen as the best treatment for the purpose.

Also mfrs. of LIQUID Dairmol Antiseptic and Deodorant.

DALARE ASSOCIATES

23rd and Locust Sts. PHILADELPHIA 3, PA.

TOTAMIN

T. M. Reg.

- **Amino Acids**
- **Minerals and Vitamins**

SOLD THROUGH THE VETERINARIAN

Write for an illustrated folder today or ask your distributor.

NUTRITIONAL MINERALS

Box 505, 404 E. 12th St.

Sioux Falls, S. Dak.

Keep Teat OPEN — Keep It MILKING

To maintain unrestricted milk flow and provide antiseptic protection is of first importance in the care of Injured teats, Scab teats, Stenosis, and in post operative therapy. Dr. Naylor Medicated Teat Dilators are SULFA-impregnated surgical dressings for the teat canal.

They act both medically and mechanically to provide prolonged broad spectrum germicidal activity and gentle non-irritating support to traumatized sphincter and teat mucosa. They promote normal tissue repair with a minimum of altered milking function of the streak canal. Positive retention — fit large or small teats.

WITH ANTIBIOTICS

The soft, highly absorbent properties of Dr. Naylor Dilators make them an ideal vehicle for additional local medication of your choice. To obtain the synergistic bactericidal action of Antibiotics and Sulfathiazole following teat surgery, saturate with your favorite udder infusion antibiotic.

Dr. Naylor's

MEDICATED TEAT DILATORS

DISPENSING PACKAGE (Contains 15 Dilators) $4.50 per doz. →

Have you used BLU-KOTE for Cowpox*, Ringworm, Moist Lesions, Skin Abrasions? Blu-Kote dries oozing lesions, reduces pus formation, controls secondary infection* . . . Quick Drying . . .

BLU-KOTE contains Acriflavine and Gentian Violet in combination with fungicidal Sodium Propionate and cleansing, debriding Urea. Effective against both bacterial and fungus infections most common in skin lesions of large and small animals.

4 oz. bottle (dispensing label) Per Doz. $8.00.

H. W. NAYLOR CO., MORRIS, NEW YORK

provides maximum protection against: **canine distemp**

IMMUNIZATIO

Products to use:

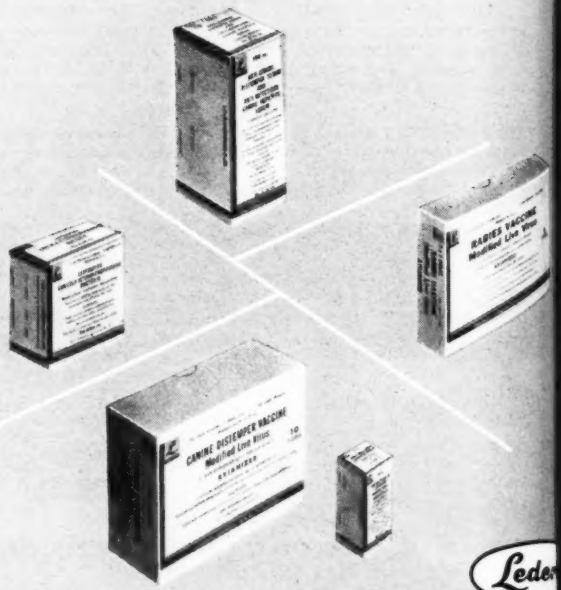
AVIANIZED® CANINE DISTEMPER VACCINE Modified Live Virus (Chick Embryo Origin-Vacuum Dried)

ANTI-CANINE DISTEMPER SERUM and ANTI-INFECTIOUS CANINE HEPATITIS SERUM (Canine Origin)

INFECTIOUS CANINE HEPATITIS VACCINE Canine Origin (Inactivated)

LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN (Whole Culture Inactivated)

AVIANIZED RABIES VACCINE Modified Live Virus (Chick Embryo Origin—Vacuum Dried)



Lede

em nine leptospirosis infectious canine hepatitis rabies

1 TO 2 WEEKS AFTER WEANING:
Antiserum and distemper vaccine.

2 WEEKS LATER:
Hepatitis and leptospirosis vaccines.

2 WEEKS LATER:
Second dose, hepatitis and leptospirosis vaccines.

5 TO 6 MONTHS:
Rabies vaccine.

OPROGRAM

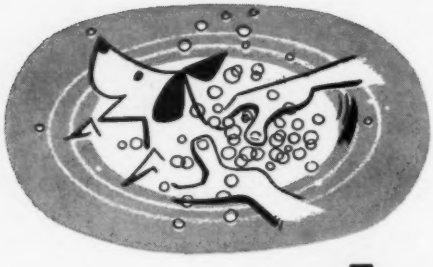
In small animal immunizations, provide a program of protection

Use Lederle-developed, potency-tested vaccines and antisera, designed to elicit solid, durable immunity during the post weaning period of maximum susceptibility.

The client pamphlet Protect Your Pet was prepared to save you valuable outpatient time. It will answer many of the commonly asked client questions for you. Keep a supply in your office or waiting room. Get them from your Lederle representative.

Leder ERLE LABORATORIES DIVISION *AMERICAN CYANAMID COMPANY* PEARL RIVER, NEW YORK

the better therapeutic shampoo...



derisol*

Contains:

Cadmium Sulfide. . . . . 1% w/v
Detergent, Foaming Base . . . . . q.s.

Derisol is exceptionally effective as an easy to use, highly efficient shampoo. Its use is particularly recommended in animals with skin disease, such as pruritus, dermatitis, eczema, non-specific and seborrheic dermatoses, alopecia, dandruff, etc.

To use: wet hair with warm water, then apply sufficient Derisol to make a lather. Work this well into the coat.

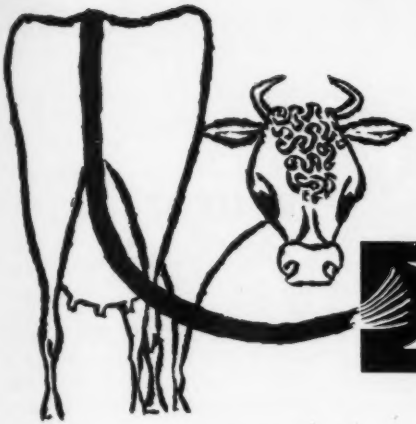
When used as a simple shampoo, rinse off within 5 minutes. When treating skin disease leave the lather in the coat at least 10 minutes before rinsing off. Repeat as indicated.

In gallons and in cartons of 12-6 oz. bottles.

*TRADE MARK

PITMAN-MOORE COMPANY

division of
ALLIED LABORATORIES, INC.



Specifically . . .

HORMONES

Arnold quality pharmaceuticals for graduate veterinarians at reasonable prices

PRODUCT	DESCRIPTION	INDICATIONS
DIENESTROGEN	5 mg. Dienestrol/cc. in special oil base. 10 cc. vials.	To promote conception in "shy-breeding" cows.
ESTRADIOGEN	3 mg. Estradiol Dipropionate/cc. in special oil base. 10 cc. vials.	For anestrus, mummified fetus, pyometra, urinary incontinence, enlarged prostate.
POSTERIOR PITUITARY *Double U.S.P*	20 U.S.P units/cc. Posterior Pituitary. 10 cc. vials.	To stimulate contraction of smooth muscles of uterus, urinary bladder, blood vessels, intestines or milk acini.
PROGESTERONE	10 mg. Progesterone/cc in special oil base. 10 cc. vials.	To prevent habitual and threatened abortion, treat cystic ovaries and nymphomania, delay estrum, stimulate endometrial development and secretions, favor nidation of ovum.
STILBESTROGEN	Diethylstilbestrol fortified with Estradiol Dipropionate in special oil base. No. 4—4 mg. Stilbestrol w/1600 units Estradiol per cc., 60 cc. vials. No. 10—10 mg. Stilbestrol w/4000 units Estradiol per cc., 30 cc. and 60 cc. vials. No. 25—25 mg. Stilbestrol w/10,000 units Estradiol per cc., 10 cc. and 30 cc. vials.	For anestrus, retained placenta, mummified fetus, pyometra, inhibition of lactation, urinary incontinence, vaginitis in spayed bitches.
TESTANDROGEN	25 mg. Testosterone Propionate 1 cc. in special oil base. 10 cc. vials.	For impotency, cryptorchidism, testicular deficiency, benign prostatic hypertrophy, inhibition of lactation, breast carcinoma.

ARNOLD — Arnold PHARMACEUTICALS

Send for catalog of Arnold veterinary pharmaceuticals and supplies.

ARNOLD LABORATORIES · NEW CASTLE, INDIANA

FOR STIMULATING ANIMALS DURING *UNDUE STRESS*

dynamone
ARMOUR

Primary ketosis of dairy cows (if glucose therapy is utilized)*
Dehydration
Fever toxemias
Exhaustion or fatigue
Pre- and postoperative support
Management of convalescence
Cachexia

***Dynamone (Armour) cannot be considered as a replacement for Adrenomone in severe cases of primary ketosis.**

2-way therapeutic action

An efficient and economical physiological stimulant, containing 100 U.S.P. units of ACTH in a 50% glucose solution. Dynamone (Armour) provides the animal with a two-fold source of energy (1) REPLACEMENT THERAPY glucose being an immediate available energy source.

(2) STIMULANT THERAPY — ACTH serves as a stimulant for adrenals providing the entire spectrum of gluco-corticoids (compound E-and F-like steroids) which in turn accelerate the conversion of fat and protein to glucose and glycogen.

Dynamone (Armour) maintains the blood sugar concentrations at normal or above normal levels for eight or more hours and is *four or more* times as effective as glucose alone in maintaining blood sugar levels.

Package information: Dynamone (Armour) is available in cartons containing 6 and 12 x 500 cc. bottles.

ARMOUR **Veterinary Laboratories**
A Division of Armour and Company
520 N. Michigan Ave., Chicago 11, Ill.

Leptospirosis: A Major Disease of Livestock

The existence of animal leptospirosis was recognized only relatively recently in the United States.

To Kirkwood and Horning (1923) goes the distinction of having made the first report of its existence in the United States (see VETERINARY MEDICINE, 18:936 [Oct.], 1923). The authors reported demonstrations of spirochetes in mouth lesions, blood, and mascerated kidneys of dogs suffering what was then commonly termed sore mouth, Stuttgart's Disease, or canine typhus. Jungherr (*Jour. Am. Vet. Med. Assn.*, 91:661 [Dec.], 1937) studied the disease and Meyer and coworkers reported its existence among dogs in San Francisco (*Proc. Soc. Exp. Biol. & Med.*, 38:17, 1938).

The earliest record of bovine leptospirosis in the United States was reported by Jungherr (*Jour. Am. Vet. Med. Assn.*, 105:276 [Nov.], 1944), less than 12 years ago. Since, leptospirosis has been shown to be a major livestock disease; virtually all domestic meat animals are suceptible. Losses attributed to its ravages are estimated in excess of $100,000,000. annually in cattle (Losses in Agriculture, June 1954).

"The major growth of the leptospirosis problem," states Dr. K. R. Reinhard*, "presents an object lesson for the veterinary profession." Today's exotic diseases may be major livestock disease problems tomorrow.

From a pathological standpoint, abortion a minor event in cattle illness due to leptospirosis. It assumes importance as a physiologic aberration because it robs the grower of herd replacements or crops of calves. Though the losses directly attributable to infection, including milk production, loss of calves, retardation of growth, et cetera, are tangible and real, the carrier animals loom large in any scheme of control. Time for natural correction varies with the species and has been generally well-defined. This suggests the importance of isolation of replacements, closed-herd management, and hygenic measures for prevention and control that are as well planned under practical farm conditions.

Prophylactic vaccination should be considered on the herd basis in the event of known exposure or initially in the face of a threatened outbreak. Individual treatment with antibiotics early in the course of the disease is recommended by Reinhard who warns that the course of apparent advanced leptospirosis can not be altered by any known therapeutic agent including the antibiotics. Inapparent infections may recover completely spontaneously. In these cases symptoms are not manifested but result of infection may be serious.

▼ ▼ ▼

*Leptospirosis. Michigan State University Centennial Symposium Report.

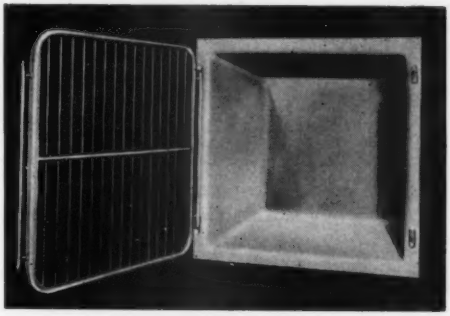
M·A·C

Quick relief for Bone, Bursal or Tendon Lameness

Single Bottle.....$2.00
3 and 1 free.....5.00
6 and 2 free.....9.00
12 and 4 free.....17.00
24 and 4 free.....28.00

CARTER-LUFF CHEMICAL CO.
Hudson, N. Y.

▼ ▼ ▼

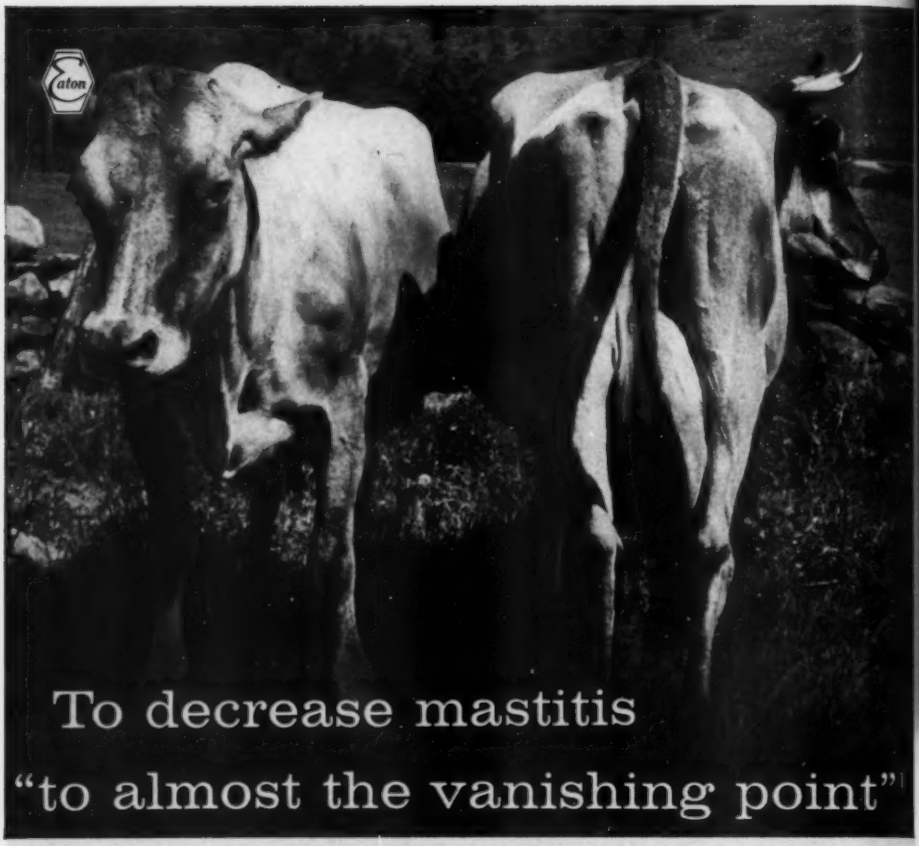


The ORIGINAL
GLASS-PLASTIC CAGE

Now better than ever

Before you install new cages WRITE TODAY for complete information on these modern cages by Kirschner . . . time tested—molded, seamless construction, minimum maintenance. Equipped with the door built to last a life time.

Kirschner
MANUFACTURING COMPANY
Vashon, Washington



As an adjunct to proper herd management, the professional drug for control of acute and chronic mastitis is FURACIN—one of the *nitrofurans*, a unique class of antimicrobials.

- wide spectrum of activity against gram-positive and gram-negative organisms
- bactericidal action; little or no development of bacterial resistance on continued application[2]
- sustained effectiveness in the presence of pus, blood, milk or serum
- nonirritating to udder tissue and well tolerated in acute, inflammatory conditions[1]
- does not interfere with normal milk production[1]

Furacin® Veterinary

BRAND OF NITROFURAZONE

AVAILABLE THROUGH YOUR PROFESSIONAL DISTRIBUTOR

FURACIN SOLUTION VETERINARY—
a water-miscible liquid of Furacin 0.2% in polyethylene glycol and water for instillation. Bottles of 500 cc. with rubber stopper, and 1 gal.

FURACIN-PENICILLIN GEL—
a crystalline suspension of Furacin 2% and procaine penicillin G (13,333 units per cc.) in peanut oil with aluminum monostearate. Available in rubber-capped vial of 100 cc.; and applicator tube of 7.5 cc., box of 12.

1. Kakavas, J. C., et al.: J. Am. Vet. M. Ass. 19:203 (Sept.) 1951.
2. Kakavas, J. C.: Antibiotics Annual 1954-55, New York, Medical Encyclopedia, Inc., 1955, p. 323.

EATON LABORATORIES NORWICH, NEW YORK

Faster relief from inflammatory reactions, infections, allergies and trauma

METIMYD Ointment

Veterinary with Neomycin

—the high-potency corticosteroid METICORTELONE + Sulfacetamide Sodium and Neomycin

OCULAR INFLAMMATION
EDEMA
ALLERGY
OTITIS EXTERNA
NONSPECIFIC DERMATOSES

— antibacterial spectra effective against most bacteria likely to be found topically

— sensitization to the topical use of either antibacterial agent extremely rare

METIMYD Ointment Veterinary: prednisolone acetate 0.5%, sulfacetamide sodium 10%, neomycin sulfate 0.25%, ⅛ oz. applicator tube, boxes of 1, 12 and 36.

METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.

METICORTELONE,* brand of prednisolone.

Schering

*T.M.

A new therapeutic concept
for diarrhea in calves and dogs

VARITON
Compound

. . . Slows peristalsis
. . . Destroys enteric bacteria

antimotility

". . . diphemanil methylsulfate [acetylcholine blocking agent] utilizes a new concept in the treatment of diarrheas, that of inhibiting gastrointestinal motility"[1]

antibacterial

". . . phthalylsulfacetamide is the sulfonamide of choice in the treatment of enteric infections in veterinary medicine"[2-4]

rapid-acting

". . . in calves, two 300-mg. boluses per day, from one to three days, was sufficient . . . to bring about an uneventful recovery"[1]

well tolerated

". . . produces no observable systemic side effects or sensitivity reactions"[1]

Schering

Indications

IN CALVES: calf scours

IN DOGS: uncomplicated diarrheas, persistent gastrointestinal disturbances

Packaging:

LARGE ANIMALS — VARITON Compound Boluses, jar of 24 boluses; 6 jars, 24 boluses per jar

SMALL ANIMALS — VARITON Compound Tablets, bottle of 100

1. Christian, A.B.: Variton and Variton Compound in the treatment of bovine diarrhea. N. Am. Vet. *37*:557 (July) 1956.

2. Rogoff, G.: Phthalylsulfacetamide (Thalamyd) in veterinary medicine. J.A.V.M.A. *117*:220, 1950.

3. Williams, K.T.: Treatment of canine diarrhea. Vet. Rec. *66*:283, 1954.

4. Christian, A.B.: Phthalylsulfacetamide as a treatment for infectious calf scours. J.A.V.M.A. *121*:185, 1952.

VARITON® Compound, brand of diphemanil methylsulfate and phthalylsulfacetamide.

SCHERING CORPORATION, Bloomfield, New Jersey

formulated for performance

VISTREPCIN

A highly dispersible drinking water additive formulated for use in combatting necro-black scours, vibrio dysentery, bloody diarrhea, bacillary infections and shipping fever in swine; chronic respiratory disease, laying slumps, blue comb and weight losses in fowls; coughing, calf scours, pleurisy, shipping fever, bacillary dysentery and bronchitis in calves.

EACH POUND CONTAINS:

Procaine Penicillin G	1,000,000 Units
Streptomycin Sulfate (as base)	3.0 gms.
Riboflavin	400.0 mgs.
Calcium Pantothenate	600.0 mgs.
Niacin	1,400.0 mgs.
Vitamin B_{12}	1,000.0 mcgs.
Vitamin A (palmitate oil)	100,000 U. S. P. Units
Vitamin D_3	100,000 I. C. Units

(In an inert base)

VITASIL

A vitamin-trace mineral feed supplement formulated for use as an aid in the treatment of Vitamins A, D_2, D_3 and B_{12} deficiencies in livestock and poultry. Only stabilized vitamins that are protected by a specially prepared coating are used to prolong their activity.

EACH POUND CONTAINS:

Vitamin A	110,000 U. S. P. Units
Vitamin D_2	200,000 U. S. P. Units
Vitamin D_3	50,000 I. C. Units
Vitamin B_{12}	60 mcgs.
Terramycin Hydrochloride	50 mgs.
Manganese Sulfate	280 mgs.
Cobalt Sulfate	140 mgs.
Iron Sulfate	3 gms.
Copper Gluconate	300 mgs.
Calcium Phosphate	9.1 gms.

(In a wettable grain meal base with soy bean oil)

DI-OPTHO POWDER

Formulated for the effective use in the treatment of infectious keratitis (pink eye) of cattle. The refinement process of this powder allows greater surface action. It is packed in a unique two ounce puff-bottle that operates at any angle.

EACH BOTTLE CONTAINS:

Tyrothricin	0.05%
Sulfathiazole	20.0%
Sulfanilamide	78.95%
Phenacaine Hydrochloride	1.0%

GUAIACOL POWDER

Formulated as an expectorant to help loosen accumulated mucus in the upper respiratory tract of large animals. The action of this powder is more effective due to its homogenous blend.

EACH POUND CONTAINS:

Potassium Guaiacol Sulfonate	20%
Ammonium Chloride	30%
Potassium Dichromate	10%

(In a flavored sodium chloride base)

Laboratory Service for Veterinarians

VETERINARY DIAGNOSTIC LABORATORIES

These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, tissue sections, bacteriological cultures, cultures for ringworm and blood chemistry. It is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

Sample containers and price list on request.

VETERINARY DIAGNOSTIC LABORATORIES

220 East 23rd St., New York 10, N.Y.

Finest Results

You'll do better with *the Veterinarian's Clipper*

Oster ®

Finest results for all professional animal clipping requirements . . . general, plucking length and surgical shaving. You can select the right blade for every operation from a complete range of clipping blades. Detachable cutter head enables you to use all sizes of cutting blades on one clipper.

JOHN OSTER MANUFACTURING CO.
Dept. P, 5025 N. Lydell Avenue
Milwaukee 17, Wisconsin, U.S.A.

MEETING CALENDAR

Sixth annual veterinary symposium on The Newer Knowledge About Dogs. Kankakee, Illinois Civic Auditorium, October 24, 1956. Dr. Robert Graham, University of Illinois School of Veterinary Medicine, chairman.

Interstate Veterinary Medical Association. Annual Meeting. Martin Hotel, Sioux City, Iowa, October 30-31, 1956. K. W. Smith, 510 W. 19th St., Sioux City, Iowa, secretary.

Midwest Small Animal Association 19th Annual Meeting and A.A.H.A. Regional Meeting. Hotel Burlington, Burlington, Iowa, November 18-19, 1956. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield, Ill., secretary.

Washington State Veterinary Medical Association. Annual meeting. Davenport Hotel, Spokane, Sept. 21-22, 1956. P. J. Pfarr, 6306 N. Wall, St. Spokane, general chairman.

New York State Veterinary College. Forty-ninth Annual Conference for Veterinarians. Cornell University, Ithaca, N. Y., Jan. 2-4, 1957. W. A. Hagan, dean.

University of Pennsylvania. Fifty-seventh annual conference for veterinarians. College of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 8-9, 1957. Dr. M. W. Allam, dean.

Indiana Veterinary Medical Association. Seventy third annual Convention. Hotel Severin, Indianapolis, Ind. January 16-18, 1957. Dr. L. M. Borst, 3315 Shelby, Indianapolis, Ind., secretary.

Michigan State University. Thirty-fourth annual Post Graduate Conference for Veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 22-23, 1957, C. F. Clark, dean.

Iowa Veterinary Medical Association. Annual Meeting. Hotel Fort Des Moines, Des Moines, Iowa, January 22-24, 1957. F. B. Young, Waukee, Iowa, secretary.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 27-29, 1957. W. B. Bell, 1303 Hillcrest Drive, Blacksburg, Va., secretary-treasurer.

California State Veterinary Medical Association. Midwinter Conference. School of Veterinary Medicine, University of California, Davis, January 28-30, 1957. Charles S. Travers, 3004 16th Street, San Francisco, Calif., executive secretary.

Minnesota State Veterinary Medical Society. Annual Meeting. Radisson Hotel, Minneapolis, Minn., February 4-6, 1957. B. S. Pomeroy, Minnesota School of Veterinary Medicine, St. Paul 1, Minn., secretary-treasurer.

▼ ▼ ▼

Schering Corporation, Bloomfield, N. J., has released six new veterinary products thus far this year. Development of these and a number of specialties for human use has made necessary a personnel increase of 15% during this period.

Now from Pfizer, new most potent steroid high cure rate*, low dosage*

STERANE® Intramuscular-Veterinary

BRAND OF PREDNISOLONE

IN KETOSIS
28 INVESTIGATORS
299 CASES

Prompt and complete recovery in 243 cases with a single injection of 50 to 100 mg.

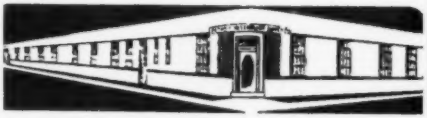
Sold to veterinarians only

Vials of 10 cc.; each cc. contains 10 mg. of prednisolone.

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N.Y.

For the Veterinarian



DETROIT VETERINARY SUPPLY CO.

DETROIT 32, MICHIGAN

—DEATHS OF VETERINARIANS—

Carroll E. Adams, Long Beach, Calif., WSC '44, June 7, 1956.

Sherman Aldridge, Gotebo, Okla., STJ '22, died recently.

Seymour Bittle, Lewisburg, Ohio, OSU '06, died recently.

William G. Black, Edmonton, Alta., ONT '10, died recently.

Charles P. Bracy, Pueblo, Colo., KCV '13, June 24, 1956.

Arthur A. Brockett, Little Falls, N. Y., COR '05, June 13, 1956.

Bert Brunink, McBain, Mich., GR '18, died recently.

Otis H. Burnside, Franklin, N. C., API '42, May 1, 1956.

George L. Cade, Rutledgedale, Penna., CVC '05, May 9, 1956.

Francis M. Cole, Santa Cruz, Calif., CVC '0[illegible] May 19, 1956.

Bohdan Czechut, Omaha, Nebr., LEM '32, July 8, 1956.

Kenneth L. Douglas, Ottawa, Ont., ONT '13, March 7, 1956.

S. R. Dunn, Corpus Christi, Texas, TEX '21, May 15, 1956.

William F. Egan, Kingsville, Texas, TEX '50, died recently.

Madison J. Enlow, Pratt, Kan., KCV '13, May 11, 1956.

Charles E. Fidler, Kewistown, Ill., CVC '05, June 6, 1956.

William L. Flanagan, North Arlington, N. J., API '30, May 22, 1956.

Donald L. Fox, Phoenix, Ariz., WSC '47, May 22, 1956.

James C. Green, Monticello, Ark., KCV '18, May, 1956.

Frank L. Gardner, Topeka, Kans., CVC '05, June 22, 1956.

Benjamin C. Harrison, Calif., KCV '09, May 11, 1955.

Richard Harvey, Montpelier, Ohio, OSU '16, died recently.

James H. Hess, Hastings, Ont., ONT '07, died recently.

Edward Himsel, Cincinnati, Ohio, CIN '13, July 4, 1956.

Frank M. Humhprey, Culpeper, Va., ONT '10, May 21, 1956.

Paul Juckniess, Omaha, Nebr., KCV '06, May 2, 1956.

Bernard J. Lattimer, Springfield, Minn., ISC '12, June 21, 1956.

A. H. Legenhausen, Dundee, Ill., CVC '10, April 9, 1956.

INDEX TO ADVERTISERS
In This Issue of Veterinary Medicine

While every care is exercised in the preparation of this index to assure accuracy, the publishers cannot guarantee against the possibility of errors or omissions.

Aeroplast Corporation XI
Armour Veterinary Laboratories XLIV
Arnold Laboratories XLIII
Ashe Lockhart, Inc. ..... XXVIII-LIII

Babson Brothers Company XXV

Carter-Luff Chemical Company XLV
Chatham Pharmaceuticals, Inc. XXXVII
Chicago Pharmacal Company XXIV
Coast Fisheries XXX
Corn States Laboratories ..... Fourth Cover
Curts Laboratories XXXIII
Cutter Laboratories XVIII

Dalare Associates XXXIX
Diamond Laboratories XIX
Detroit Veterinary Supplies Company LII

Eaton Laboratories XLVI

Fort Dodge Laboratories ..... IV-XXI
Fromm Laboratories XXIX

Gaines Foods Company XIV

Haver-Glover Laboratories LIV
Heldenbrand & Son XXXIV

Jensen-Salsbery Laboratories ..... Second Cover

Kirschner Manufacturing Company XLV

Lederle Laboratories Division ..... XL-XLI
Livestock Chemical Company XXXII

Mason Fence Company XXXII
Massengill, S. E. Company XXXVIII
Merck Sharp & Dohme V
Meyer, Theo., Estate XXXVI

Naylor, H. W. Company XXXIX
Norden Laboratories 549
Nutritional Minerals, Inc. XXXIX

Oster, John, Manufacturing Corp. L

Parke, Davis & Company III
Parlam Corporation XX
Pedrick Laboratories XXXIII
Pfizer, Chas. & Company ..... XIX-XXV-LI
Pitman-Moore Company ..... XXVI-XLII

Research Laboratories, Inc. XV

Schering Corporation ..... IX-X-XVI-XVII, XLVII-XLVIII
Squibb, E. R., & Sons ..... XII-XIII

Texas Phenothiazine XXXIV

Upjohn Company, The VI

Veterinary Diagnostic Laboratories L
Vitamineral Products XXXI

Warner-Chilcott Laboratories ..... XXII-XXIII
Winthrop Laboratories ..... Third Cover

The firms listed can serve your requirements for products and equipment they manufacture and distribute. Please mention VETERINARY MEDICINE *when you write advertisers; it will identify you.*

alva*...

now in the new 50-dose bottle is ready to go to work in seconds!

Alva, Lockhart's erysipelas vaccine avirulent, is now available in a 50-dose package. Because of an exclusive new Lockhart process, 50-dose Alva reconstitutes in seconds . . . is ready to go to work immediately to provide a safe, durable erysipelas immunity.

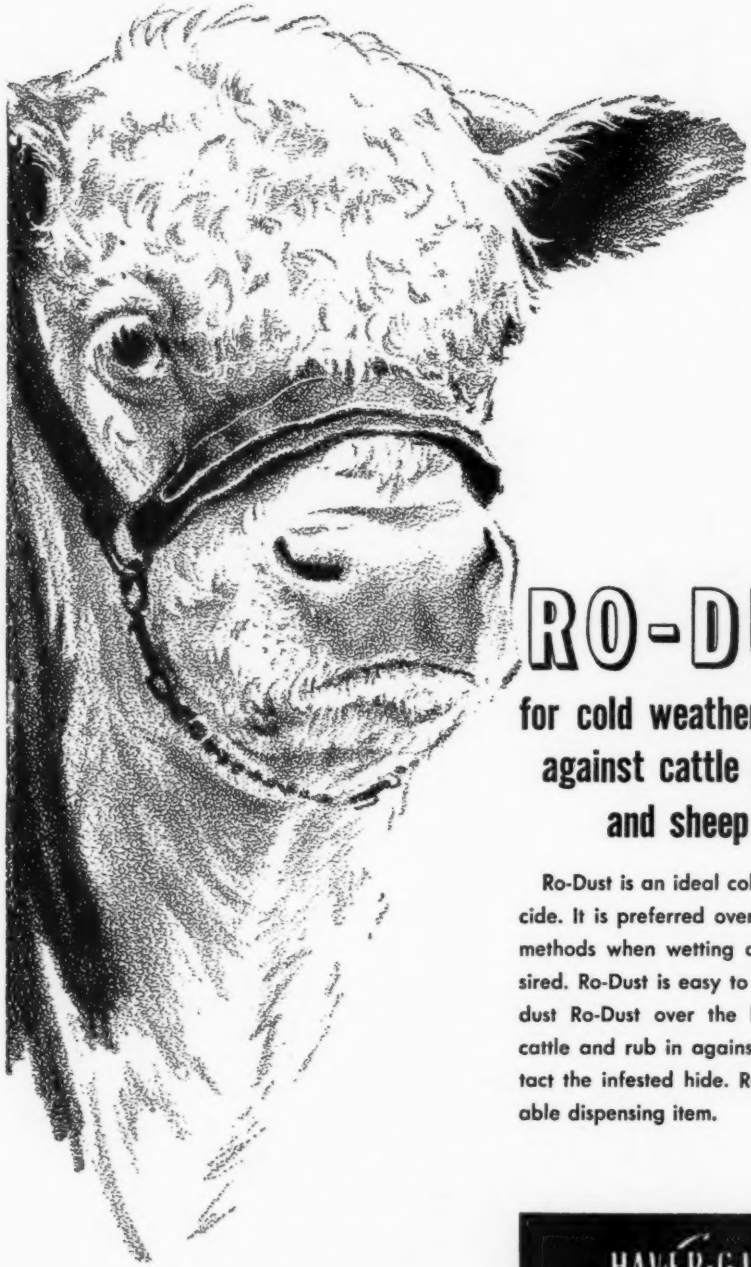
Alva is vacuum stoppered for greater stability, desiccated for maximum potency . . . a live culture vaccine that is effective and economical. Alva may be used without serum unless pigs have been exposed to or infected with erysipelas.

In addition to Alva in 5, 25, and 50-dose packages, Lockhart also offers you Erysipelothrix Rhusiopathiae Vaccine, Erysipelas Bacterin and Anti-Swine Erysipelas Serum.

*Trademark

LOCKHART

ASHE LOCKHART, INC.
800 WOODSWETHER ROAD KANSAS CITY 6, MISSOURI



RO-DUST

for cold weather protection against cattle grub, lice, and sheep ticks

Ro-Dust is an ideal cold weather insecticide. It is preferred over the dip or spray methods when wetting animals is not desired. Ro-Dust is easy to apply . . . simply dust Ro-Dust over the backs of infested cattle and rub in against the hair to contact the infested hide. Ro-Dust is a profitable dispensing item.

HAVER-GLOVER *Laboratories* INCORPORATED